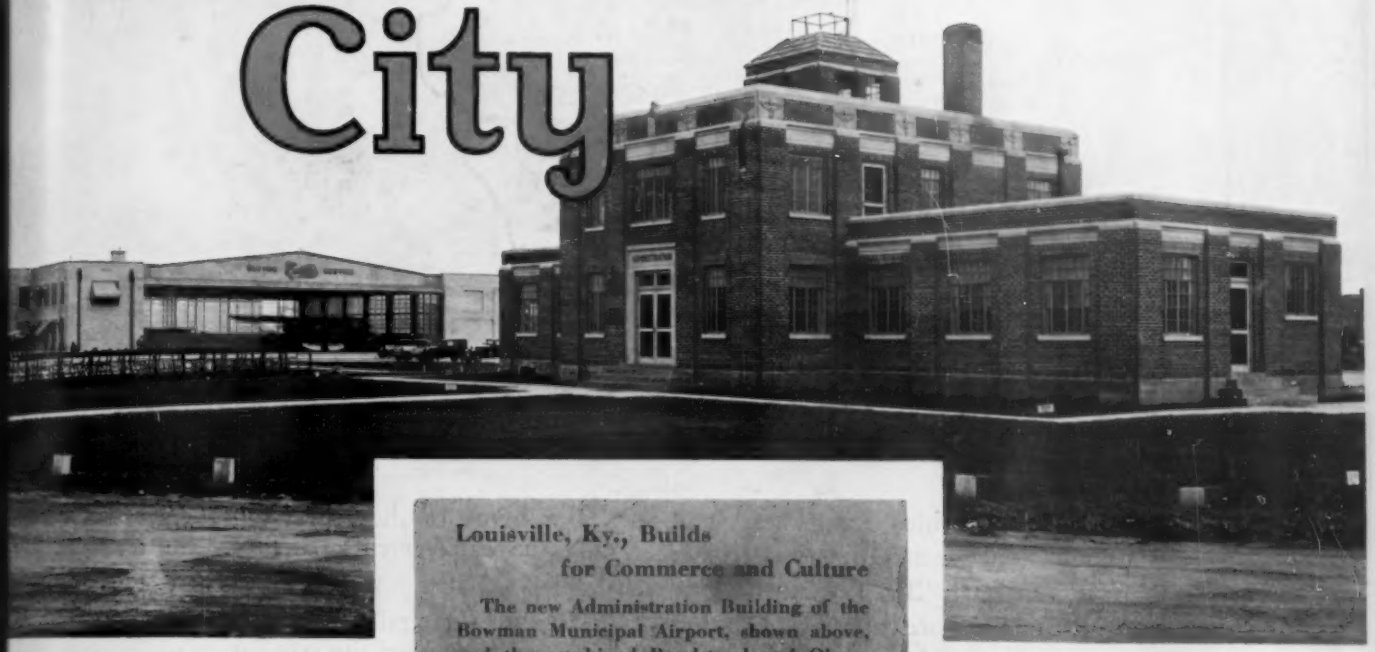
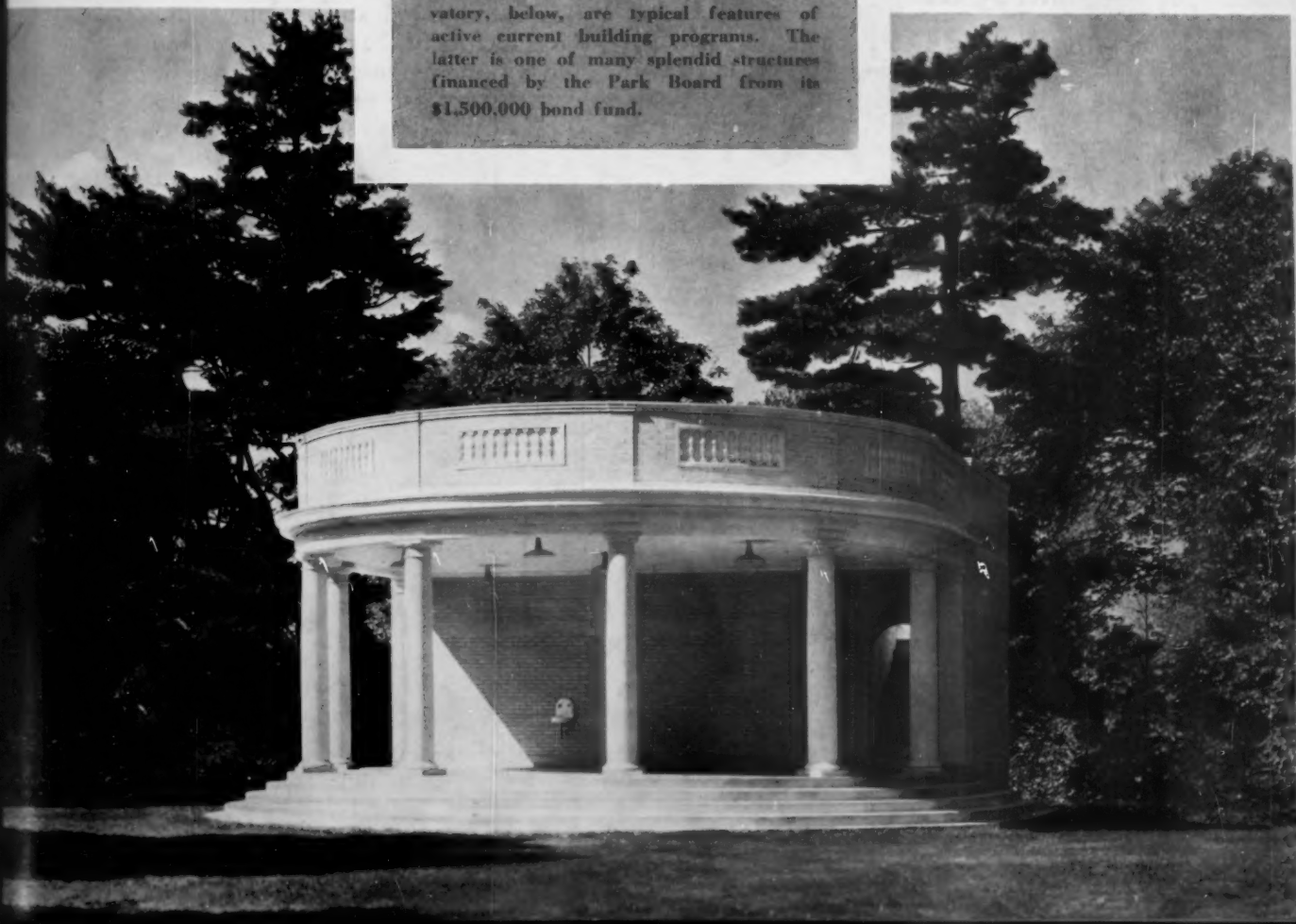
The American City

OCTOBER, 1930
Vol. XLIII, No. 4
50 Cents $4 a Year



Louisville, Ky., Builds for Commerce and Culture

The new Administration Building of the Bowman Municipal Airport, shown above, and the combined Bandstand and Observatory, below, are typical features of active current building programs. The latter is one of many splendid structures financed by the Park Board from its $1,500,000 bond fund.



The "AYES" Have It in Iowa—Nine to One

Ten Iowa cities stand head and shoulders above all other cities in this State. Iowa's "Big Ten" include all cities in the State with a population over 25,000.

The question is put to these cities, which has previously been put to the chief cities of States in other sections of the country. The question is: "How many of these first ten Iowa cities have pavements of TEXACO Asphalt?"

The answer again demonstrates in convincing manner the popularity of TEXACO-paved streets among the largest cities of the country. Nine of the ten leading cities of Iowa are today served to some extent by TEXACO Asphalt paving.

A TEXACO Asphalt pavement on High Street in the City of Burlington, Iowa

Wesley Avenue, busy thoroughfare of Sioux City, Iowa, was paved with TEXACO Asphalt in 1925

TEXACO ASPHALT

New York
Philadelphia
Richmond
Boston
Jacksonville

The Texas Company
ASPHALT SALES DEPT.
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Chicago
Cleveland
Kansas City
Houston
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Buffalo

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In THE MUNICIPAL INDEX (an 850-page annual volume) readers will find much material, including articles, lists and bibliographies on a wide variety of municipal and civic subjects, not published in the monthly issues of THE AMERICAN CITY

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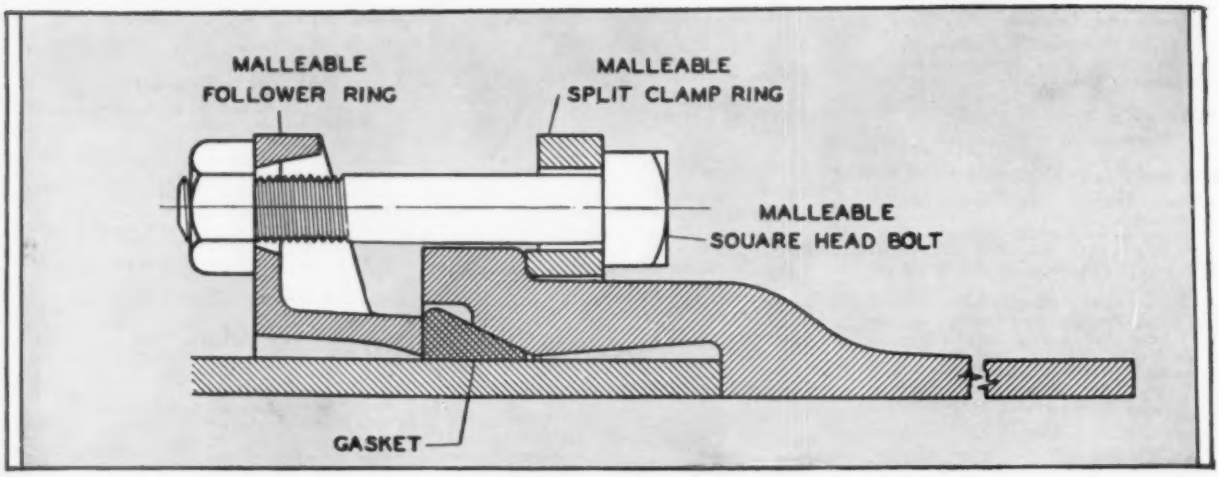
Speed up your pipe laying . . .



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Now, with the new Anthony Joint, a contractor with a low priced, unskilled gang can complete a 100% gas-tight line well within his time contract. No tedious calking with the new Anthony Joint. No time taking pouring. No uncertainties. Just slip on the gasket, tighten up the bolts and your joint is finished — to stay.

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When you write for that catalog, kindly mention THE AMERICAN CITY

Convention and other Items for Mayors and City Managers

City Managers Hold Successful Convention in San Francisco

THE seventeeth annual meeting of the International City Managers' Association was held in San Francisco, September 24 to 27 inclusive, with well over 100 in attendance. The report of the officers indicated that effective committee work had been carried on during the year, with the publication of a report on the qualifications and training of a city manager, and the revision of the constitution, raising the standard for active membership by increasing the length of service from one to two years, and placing this membership classification upon professional conduct.

President Stephen B. Story, in his annual address, reviewed briefly the progress made in the field of public administration during the past year, and emphasized the need for a fuller cooperation between universities and administrators, to the end that the efforts now being put forth in the training for a career in the public service be more fully realized. The Secretary reported that at present there are 403 council-manager cities in the United States, 15 in Canada and 2 in Ireland; that one out of every six cities of over 100,000 population in the United States is now operating under the plan; that twelve cities have been added since the last convention, in November, 1929; that Oakland and Dallas would vote on council-manager charters before the end of the year; and that San Francisco, Philadelphia and Detroit were manifesting considerable interest in the plan. A net gain in membership of 24, and an increase of 20 per cent in the circulation of *Public Management*, the official journal of the Association, were also reported.

The report of the research committee announced the award of two traveling fellowships during the year, the establishment of a permanent research staff in connection with the Association headquarters, and the publication recently of a report entitled "Measurement and Control of Municipal Sanitation." (See page 181.)

The time and place for the 1931 convention, in accordance with the revised constitution, was left with the executive committee, and will be determined later. The newly elected officers, chosen at the closing session, were Stephen B. Story, Rochester, N. Y., President; and Clifton E. Hickok, Alameda, Calif., Adam R. Johnson, Austin, Texas, and John P. Broome, Summit, N. J., Vice-Presidents.

CLARENCE E. RIDLEY,
Executive Secretary, International City Managers' Association.

(By telegraph, Sept. 26, from San Francisco.)

Chambers of Commerce Endorse the Manager Plan

THE most coveted testimonial is the unsolicited one. The friends of the council-manager plan have not been backward in singing its praises, though its enemies hardly ever raise their voices above a whisper except to appeal to the broad principle of separation of power or some equally sacred dogma.

Now come the chambers of commerce in an almost unanimous chorus of laudation. Organizations in cities without the manager plan are constantly making inquiries of their fellows in manager cities as to their satisfaction with the plan. The Civic Development Department of the Chamber of Commerce of the United States has sought to assist both the inquirers and those inquired of by assembling the opinions of the chambers of commerce in all cities having the council-manager plan.

A few of the replies are non-commital, owing usually to the briefness of the particular cities' experience. All of the others express distinct satisfaction. Many are quite enthusiastic. The pamphlet in which these comments are published also contains a list of material on the manager plan, a directory of manager cities and their managers and a list of cities reported to have abandoned the plan.

Why Not Develop Your City's Personality?

THAT cities, like individuals, have personalities worth developing, is a truth which needs repeated emphasis. It was forcibly presented by Bishop Charles E. Fiske of Utica, N. Y., speaking before the 1930 Conference of Mayors and other Municipal Officials of the State of New York. Deploring the fact that American cities are becoming too standardized and do not endeavor to develop an individual distinctiveness, Bishop Fiske said in part:

"From the standpoint of one who is not interested so much in the political aspects of cities as in their social, esthetic and other possibilities, I want to make one or two protests. First of all it seems to me that we are having too much standardization of cities in America. They all look alike. They all have the same variety of architecture and the same gas stations that you pass as you go down through the principal streets. They all have the same kind of hot-dog stands. They all have the same kinds or forms of apartment houses. They are all straining as hard as they can to get just exactly the same kind of office buildings. They all have the same kind of hotels. It used to be a joy to go around, because in different places I found different sorts of hotels which had their own specialties. I can remember the day when I got one thing in Philadelphia and something else in Boston, and so on, and now you get just exactly the same thing in all the hotels.

"Now, in somewhat the same way the cities and towns of the country are becoming thoroughly standardized. I have a feeling that every man and woman has a personality, and that there ought to be some way for each village and city and town to develop a personality, and that you men who are in charge of municipal affairs ought to be trying to discover what is the fine thing about your city and how you can develop that of which you have a real right to be proud. Just as a person should develop his or her personality, so the city or the town should develop its personality."

Unemployment Relief Programs in New York State

OF the 34 cities and 24 villages in New York State which replied to a questionnaire sent out in July by the New York State Bureau of Municipal Information, inquiring what, if anything, was being done to relieve local unemployment, all but seven municipalities listed the speeding up of public improvement programs. The paving and repaving of streets, construction of public buildings, stadiums, bridges, streets, water-works, sewers, sewage-disposal plants, power-plants, incinerators, park and school-ground improvements, and the planting of trees, are among the projects cited, many of which would normally not be undertaken this year. Provision is often made in awarding contracts that local men shall be given preference. Several municipalities stated that they had appealed to private corporations, which had cooperated by expanding their normal programs. One city reported that last winter when an acute situation arose, alternating three-day shifts were instituted in order to take in as many men as possible. Three cities and four villages have opened free employment bureaus, one of which has filled 1,100 positions.

The reasons given by the four cities and three villages which have done nothing to aid unemployment were that they have so few men out of work that special measures are unnecessary.

Suggestions offered as to feasible action for unemployment relief included the acceleration of local public and private construction work, giving preference to local laborers; reduction in hours of employment to include more men; and the proposal that state highway contracts be ready to let in the spring rather than around July first.

1,500,000 - gallon elevated tank recently completed for the city of Detroit, Michigan

Tank Size need not limit your choice of Storage

The advantages of elevated water storage are not limited by tank size, since we have built elevated steel tanks up to 2,000,000 gallons capacity and are prepared to build even larger tanks economically. In the other direction, we make tanks as small as 5,000 gallons capacity.

Large cities have found it economical to have elevated storage distributed at strategic points, as in Detroit. Even relatively small cities find that large capacity elevated storage may save money and at the same time improve water service.

Ample elevated storage in Horton tanks, wherever used, provides uniformly good service at annual costs lower, in most cases, than is possible by other plans. The first cost is low — which means saving in interest on the investment and small depreciation. Operating costs are cut down by the reduction of necessary pumping station pressures and because fluctuations in demand need not be absorbed by the pumping equipment.

Our nearest office will be glad to furnish estimates and full information on Horton tanks, elevated or flat-bottom type of any standard capacity.

Send for a copy!

CHICAGO BRIDGE & IRON WORKS

Chicago	2127 Old Colony Bldg.	Dallas	3306 Magnolia Bldg.
New York	3108 Hudson Terminal Bldg.	Atlanta	2114 Rhodes-Haverty Bldg.
Cleveland	2236 Midland Bank Bldg.	San Francisco	1033 Rialto Bldg.
Detroit	1501 Lafayette Bldg.	Seattle	4343 Smith Tower
Philadelphia	1616 Jefferson Bldg.	Houston	1101 Electric Bldg.
Boston	1501 Consolidated Gas Bldg.	Tulsa	2425 Exchange Bank Bldg.
Birmingham	1502 Fiftieth St., N.	Havana, Cuba	Apartado 2507

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BRIDGEBURG, ONT.

HORTON TANKS

AC-10-Gray

Pure Water—Man's Greatest Need

Items on Water Supply and Purification

Testing Large Industrial Meters in Ottawa

IN regard to the periodical inspection of meters, it has been found by actual experiments that no definite terms of years nor one complete cycle can be adopted, but rather that the period of testing of small meters depends primarily upon the make of meter and the quantity of water passed.

From actual observation, information has been secured whereby tables for the various sizes of meters have been prepared which set forth the different makes of meters and the maximum quantity of water which is registered, before the meters are returned to the shop for official test and any necessary repairs.

The practice followed in the city of Ottawa, Ont., is as follows:

All water meters are tested at regular periods, each period of testing being governed by the particular type of meter, the size and the registration in cubic feet of each particular meter.

When a complaint of excessive consumption is received by the Department, and the consumer is not satisfied as to the accuracy of the meter, a special inspector is dispatched to make an examination of all plumbing and fittings. During this inspection an effort is made to see that all water consumption within the buildings is temporarily stopped, and a reading of the meter is secured to determine whether water is passing through the meter and the consumer is losing water on account of unobserved leaks in the system.

When an examination does not reveal the presence of any leaks, the inspector temporarily connects a small-size standard meter on one of the outlets and immediately checks the registration of the master meter at various flows.

If there is any discrepancy in registration as revealed by the test meter, the large meter is removed from service, taken to the meter shop and officially tested, and a copy of the report is mailed to the consumer.

This method has greatly increased the number of satisfied customers.

W. E. MacDONALD,
Water-Works Engineer.

Postcards Used for Billing in Louisville

THE services of the Louisville Water Co., of Louisville, Ky., are only about 30 per cent metered. For this reason there are two systems of billing and collecting employed, one for the flat rate and the other for the metered consumers. Flate-rate consumers pay for six months in advance, one half paying in January and July and the other paying in April and October. A discount of 20 per cent of the amount of the bill is allowed if the bill is paid before the 10th of the month in which it is due.

For the meter billing, the city is divided into three districts. In the first group a discount of 20 per cent is allowed if the bills are paid between the 1st and 6th of the month. The second group receives the same discount if the bill is paid between the 10th and 16th, and the third group is payable between the 20th and the 26th of the month, with the same discount. Meters are read at a stated period. A summary of the billing is made, grouping the individual bills in ledgers, and when they are paid, credit is given to each consumer against the billing. After the expiration of the discount period for each group, a delinquent notice is sent to all who have failed to pay their bills within the allotted time. This delinquent notice shows the date on which the water will be turned off if the account is not liquidated. The notice also carries the information that a charge of $1 will be made for turning the water on when it has been turned off for non-payment. The same method applies for flat-rate consumers as for metered consumers when bills become delinquent.

All bills are made on one-cent postcards. The name, address and number of the bill are stamped on the card and coupon with an Addressograph, and the total amount of the billing for each group is proved before the bills are mailed to the consumers. When a bill is presented for payment, it is receipted by a cutting machine, the receipted portion returned to the consumer and the coupon dropped into a receptacle as a check against the collection. At the end of the day the cashier's coupons are added, gross and net amounts, together with the discount allowed. The net amount and the discount is a proof against the billing. After the treasurer's cash has been balanced for the day, the coupons are turned over to the billing department, and credit is given to the consumer on the bill rendered. The same method is applied to flat-rate or semi-annual consumers.

J. BAXTER KREMER,
Chief Assessor, Louisville Water Co.

Laying 54 Miles of Mains in Roseville, Mich.

DURING the past two years, the village of Roseville, Mich., has laid approximately 54 miles of water-mains. The water-supply of this village is obtained from the city of Detroit, through the city of East Detroit, so that all layouts, sizes, grades, etc., must conform to the Detroit city standards. The fire-hydrants are all Detroit Fire Department standard and are spaced a maximum of 600 feet apart with a hydrant on every corner. The city of Detroit insists on foundry inspection and also puts an inspector of its own on the job during construction, for which a charge of 3½ cents per lineal foot of main is made.

The accompanying table gives a tabulation of the costs on the 54 miles of mains laid in 1928 and 1929. Plans, staking-out and supervision of this work were done by the Village Engineering Department under the direction of the Village Manager and Engineer, and R. M. Freeman, Assistant Engineer. This work cost the village less than 2 per cent of the total figure for the work.

MAX VAN DE GREYN,
Village Manager.

ROSEVILLE, MICHIGAN
DEPARTMENT OF ENGINEERING
TABLE OF COSTS OF WATER SUPPLY SYSTEM BUILT IN 1928 & 1929

CONTRACTOR, YEAR & KIND OF PIPE	SIZE	LIN. FT.	GATE VALVES No.	GATE VALVES COST	6" DPD HYDRANTS No.	6" DPD HYDRANTS COST	TOTAL AMT. CONTRACT	COST Av. Cost per Ft.	COST Mats.	COST Labor	COST Misc.	COST Insp.	PIPE SIZES Ratio of Footage 6"	8"	12"	16"	DET. RATES Bo. Insp.	FOUNDRY INSPECT.	REMARKS
Ben Caron 1928	24"	14423	7	2000															This contract was for a 24" feeder main laid to grade
Valone	12"	849	1	1400															
& Clow	8"	1,389	12	3,050															
	6"	484																	
		16,646	56	11,400	13	1,625	48,390	.841	.018	.085			26	104	15	855	590		Contract No W.S.1-28
Ben Caron	8"	14,988	24	3480															
1928	6"	6,714	23	3125															
Val & Clow		21,702	49	6609	41	5,125	32,991	.744	.236	.304	.02		309	691			760	754	" No W.S.1-28
W.O. Hoy Co	12"	6,873	6	735	160	18,400													
1929	8"	50,242	86	7,482	4	340													
De Lamar	6"	29,593	187	9,692															
		86,708	279	17,869		18740	134,236	.176	.211	.201			393	589	18		3,105		" No W.S.1-29
Colonial Heating	8"	20,905	22	1,900	132	13,180													
1929	6"	62,905	69	5,210	15	975													
Mace Coal		83,811	91	7,110		14,155	110,068	.132	.194	.09			749	251			2,918		" No W.S.2-29
Ole Johnson	12"	2,796	22	1,638															
1929	6"	71,069	73	6,716															
Mc Vane		72,965	95	7,850	118	14750	97,933	.135	.204	.109	.02		.794	.206			2,533	2,961	" No W.S.3-29
2 Years Cost		282,855	490	51,344	483	54,395	340,513	.198	.199				331	393	23	51	9,940	3,715	All Contracts
2 excluding 24" feeder main	12"	7,122																	Excluding W.S.1-28
	8"	11,182																	
	6"	150,159	434	39,864	470	34770	418,603	.157	.206	.15	.03		.364	.418	.18				
		268,398																	

327 VACUUM CHLORINATORS

Seven W&T solution feed VACUUM CHLORINATORS (Type ASVI on the LOS ANGELES, Calif. Water Supply

FIFTY three cities are on the American Medical Association Honor Roll.

Fifty three cities with a typhoid death rate of less than two per hundred thousand — and chlorination played a vital part in making this splendid record.

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Their ease of operation, their low maintenance costs have been proven. Their absolute dependability is attested by the record of these 327 machines.

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Ask for Technical Publication 38

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Manufacturers of Chlorine Control Apparatus

NEWARK, N. J.

BRANCHES IN PRINCIPAL CITIES

A Product of

WALLACE & TIERNAN

"The only safe water is a sterilized water"

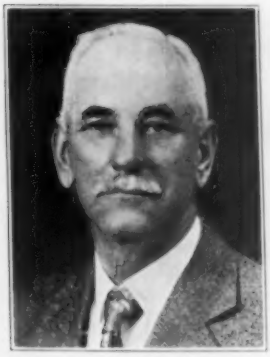
BA-26

Who's Who in Water Supply

The 34th of a Series of Portraits of Water Works Officials Which Has Appeared Monthly Since January, 1928

JOHN W. VAUGHAN
Supt., Water Works
Johnstown, N. Y.
(Appointed 1930)

EDWARD J. JUDKINS
Supt., Water Works
Franklin, N. H.
(Appointed 1928)



S. O. HARVEY
Supt., Water Plant
Greenwood, S. C.
(Appointed 1930)

PERCY TODD
Supt., Water Works
Gadsden, Ala.
(Appointed 1928)

J. E. SHIPMAN
Supt., Water Works
Phenix City, Ala.
(Appointed 1929)

ALBERT KENNEL
Supt., Water Works
Ashland, Ohio
(Appointed 1919)

CLARENCE A. ORR
District Mgr., Ky. Tenn. Light & Power Co., Mayfield, Ky.
(Appointed 1925)

R. V. TOMS
Supt., Water Dept.
Shelby, N. C.
(Appointed 1921)

SAMUEL H. MACKENZIE
Supt., Water Works
Southington, Conn.
(Appointed 1911)

RALPH J. GOODWIN
Supt., Dept. of Public Utilities
Dothan, Ala.
(Appointed 1918)

OSCAR L. HOLMES
Div. Mgr., Eastern States Public Service Corp., Paducah, Ky.
(Appointed 1928)

LEONARD A. BERGMAN
Director of Public Works
Jamestown, N. Y.
(Appointed 1921)

L. A. FISHER
Supt., Water Dept.
Concord, N. C.
(Appointed 1910)

ELMER R. SMITH
Supt., Water Dept.
Bedford, Ohio
(Appointed 1920)

The "Pittsburgh-Des Moines" Incinerator Utilizes ALL of the Garbage as Fuel

1—Burning Hearth

2—Sloping (Drying) Hearth

3—Stoking Doors

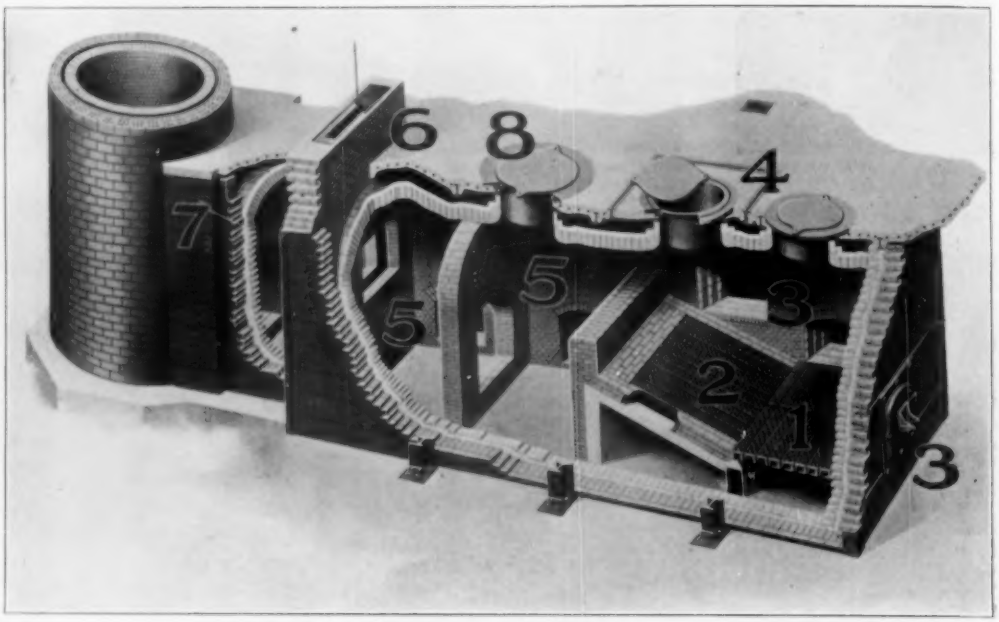
4—Charging Doors

5—Combustion Chambers

6—Damper between Gas Combustion Chamber and Flue

7—Stack

8—Carcass charging Hole



One-unit Single Hearth PDM Furnace

It saves the equivalent of 120 pounds of coal in every 2000 pounds of garbage burned.

Wellsville, N. Y.
25 Tons—Daily Capacity

One pound of ordinary mixed garbage and refuse, **after drying,** has a fuel value equal to approximately 3/10 of a pound of coal. To obtain maximum operating efficiency and economy an incinerator should, therefore, be so designed that **all** of the dried garbage can be utilized as fuel.

About 20 per cent of the dried garbage in many other incinerators becomes lodged in or rolls to a "dead" portion of the furnace, that is, between the main mass of wet refuse and the furnace outlet flue. This "dead cell" material can never serve efficiently as fuel to dry another incoming wet charge of rubbish. Why waste this usable fuel equivalent—equal to 120 pounds of coal in every 2000 pounds of garbage charged into the furnace? There are no "dead cells" in the PDM furnace.

Wet garbage is not dumped directly on the fire in the PDM furnace. It goes first on the sloping drying hearths (No. 2) to dry out, then rolls or is raked down to the burning hearths to serve as fuel. Selective charging through several holes breaks up the garbage into smaller piles or cones to provide the maximum surface exposure to the hot gases and flames passing from the burning hearths directly over the wet garbage on the drying hearths.

State your population and write today for your copy of the new PDM Incinerator Catalog.

Pittsburgh-Des Moines Steel Company

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Des Moines **San Francisco** **Seattle** **Chicago** **Atlanta** **Dallas**

Sewage Treatment Means Clean Streams

SEWERAGE and SEWAGE DISPOSAL

Pasadena Uses Activated Sludge Treatment

THE sewage disposal plant serving the city of Pasadena, Calif., as well as the adjacent communities of Alhambra, South Pasadena and San Marino, is sufficiently near all the communities served so that the sewage is fresh on arrival and possesses no more odor than that characteristic of fresh sewage. This odor is most pronounced at the screen house but, since in this climate the screen house is but a shelter open to the atmosphere on four sides, the odor is rapidly dissipated and is not perceptible 20 feet from the house in any direction.

The activated sludge process is employed. Aeration begins in conduits and troughs as soon as the sewage passes the screen operation, and is continued until the mixed liquid or combined effluent and sludge reaches the clarifiers or settling tanks. In these tanks a sufficient stability has been gained, usually about five days, so that no odor nuisance exists there. The return sludge is constantly aerated until reaching coagulation tanks and is sufficiently stable so that no perceptible odor occurs. The surplus sludge is filtered and dried for fertilizer.

In the drying operation gases and vapors of very disagreeable odor can be created. Products of combustion, vapors and steam created in the drying process are immediately exhausted from the dryer and taken to a combustion chamber in which a high temperature is maintained, thoroughly destroying any odors created in the drying process. This combustion chamber, in the form of a stack 40 feet high, discharges the products of combustion at sufficient height for a very rapid dissipation into the atmosphere.

The clarified effluent flows through an underground channel approximately four miles to a watercourse. The stability of the effluent is of about five days' duration, but as it is absorbed into the gravels or the stream within a comparatively few hours, no odor nuisance exists from this practice.

G. K. HOOPER,
City Engineer.

Brookline Finds Difficulty in Laying Sewers

THE practice in laying sewers in new districts of Brookline, Mass., is to place them approximately in the center of the street. The streets are generally of such width that there is no need of duplication of the mains. The Board of Survey has established a minimum width of 50 feet for residential streets, 60 feet for streets of secondary importance, and 80 to 100 feet for the main thoroughfares.

In streets of 50- and 60-foot widths, it is difficult to find adequate room for all the structures for which locations may be required underground, so it would seem impracticable to lay more than one line of the same character.

All new drainage work is being carried out on the separate system, as the sanitary sewers are connected either directly or indirectly with the metropolitan system. This means that pipes have to be laid for the house sewers, and another system for the surface water drains, such as catch-basins, roof water, etc. In addition to these two mains, locations for water pipes, electrical conduits and telephone conduits and gas pipe have to be provided. With the clearance required for most lines, this leaves practically no space in a street of ordinary width. It is also required in Brookline that no structure be placed within 3 feet of the outer surface of a tree, and, as trees are planted in practically all residential streets, this reduces the available width of underground structures at least 14 feet.

One street in Brookline has a width of from 160 to 190 feet. At present it is almost impossible to find a location for another underground structure in this street, because the town is practically surrounded by the city of Boston, and many mains not owned or controlled by Brookline have to pass through the town.

HENRY A. VARNEY,
Town Engineer.

Sewage Treatment Plants Should Have Proper Care

IN 1917, one of the first sewage disposal plants of the Imhoff type to be built in Kansas was constructed at Neodesha. The plant consisted of the Imhoff tank, pump, pit, pump-house with dosing tank, screen chamber, sludge bed, sprinkling filters, and final settling basin.

The plant was put into operation April 11, 1918, and proved very satisfactory in every respect except that the odors from the plant caused much dissatisfaction during the hot summer months. Various remedies were tried with little success, and it was necessary at times to by-pass the filters. Running the sewage through the Imhoff tank and the final settling basin permitted the removal of most of the solids but did not change the stability test more than 5 per cent.

Chloride of lime was tried, using a large tank with an agitator and feeding into the dosing tank. This was very expensive and met with little success, if any, as the odors were all coming from the sprays of the sprinkling filters. The plant was kept clean by washing down the walls of the intake or screen chamber, the Imhoff tank and the dosing tank with a hose.

In July, 1927, through the State Department of Health and with the cooperation of Wallace & Tiernan Co., a series of experiments with chlorine were run, and it was found that the odors would be controlled in a satisfactory way by putting the chlorine into the raw sewage in the intake chamber and changing the flow of the sewage by means of baffle-walls, making the flow longer and through a narrow channel. This gave the chlorine a better chance to mix with the sewage. There has been little complaint during the past two years and the sprinkling filters have been working at all times.

Sludge is removed often in small quantities, which does not work the drying bed so hard and makes it possible to remove the dry sludge much quicker than in large quantities. From 35 to 40 pounds of chlorine per day are used during the hot weather, and one man is kept busy at the plant during the summer looking after the plant in general, mowing the lawn, cutting weeds, etc.

The worst trouble with most sewage treatment plants seems to be that they are put into operation and then forgotten, but this is the wrong idea and costly in the end. A sewage disposal plant is a public utility and should have the same care and attention as any other utility. With the sewer system, it represents as much money to the taxpayer as the water, gas or electric systems. The sewers should be kept clean; it is felt that this has a great deal to do with odor control. If laterals and mains become foul, it is sure to affect the sewage before it reaches the treatment plant.

J. M. NEWBERRY,
City Engineer.

No Revenue from Sludge

SEWAGE sludge which has been well digested in the separate sludge digestion tanks at the Third Fork Creek plant at Durham, N. C., and in the Imhoff tank at the New Hope Creek plant, is drawn onto uncovered sand-drying beds to a depth of 8 to 10 inches. After drying, the sludge, having a thickness of 3½ to 5 inches, is removed by hand and hauled in a dump-cart, drawn by one mule, to the adjacent fields, which are owned by the city, and deposited there. A few unsuccessful attempts have been made to get local farmers to use sludge as fertilizer on their nearby farms. At present the city derives no revenue from the sale of the sludge, according to Albert M. Worth, Sanitary Engineer.

In Klamath Falls, Ore, the sludge flows by gravity from the digester to the drying beds. E. A. Thomas, Assistant City Engineer, reports that, after thorough drying, the sludge is removed by farmers for use as fertilizers without revenue to the city.

J. B. Westcott, Commissioner of Public Works, Bridgeton, N. J., says that they have been unable to find a buyer for the sludge from their sewage plant and at present are using it for fill.

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Asphalt Kettles
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Don't wait until a road needs resurfacing—reduce your highway cost by proper maintenance. Since 1900 we've studied maintenance problems and built maintenance equipment. There are Littleford outfits made for small and large patch work, small surfacing jobs, widening of highways, etc. May we send you complete information about Littleford equipment?

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During October we hope you will remember to mention THE AMERICAN CITY.

"Keep Your Streets Clean"

Items on Street-Cleaning Problems and Methods

Mechanical Cleaning of Streets in Winnetka, Ill.

CLEANING of streets, mainly by mechanical equipment, in Winnetka, Ill., was handled at a total cost of $4,667 for 1929, with the business sections cleaned every other day as weather permitted, and the residential sections at intervals of two weeks. A total of 2,390 miles was cleaned, at an average cost of $1.82 per mile. A total of 2,147 cubic yards of street sweepings were collected and disposed of.

The use of mechanical equipment for street cleaning has well justified itself, as this work is now being handled at a lower cost than three years ago, with considerably better results. The only difficulty experienced is the practice of a very few householders who continue to leave piles of unburned leaves and other débris in the gutters. This material is very difficult to remove with the machine and also gives very unsightly appearance to the street.

The maintenance of sidewalks and pavements during the winter was more expensive than usual, not because of snow removal, but because of the unusual icy condition of the 1929 winter season. The total cost of snow removal from sidewalks and pavements, and spreading of sand, was $3,386, or approximately twice the usual cost of the service. The sanding of sidewalks was handled with efficiency by the Street Department, which on one occasion had 12 trucks and 50 men at work before daylight in order to have the sidewalks safe for school children and commuters the following day.

The Street Department is carrying on an investigation of the use of tractor equipment for removing snow from sidewalks but, because of the light snowfalls last season, was unable to secure the necessary cost data on which to base a decision on the question of discontinuing the use of horse-drawn snow-plows.

It is interesting to note that the village has completely discontinued the use of horses for all street work except snow-plowing, having disposed of its horses during the past year. With the present low cost and high efficiency of motor equipment, a considerable saving has been found possible in all classes of public work where horses were formerly used.

H. L. WOOLHISER,
Village Manager.

Atlantic Coast Cities Use Variety of Methods

ABOUT 20 miles of streets in Savannah, Ga., are cleaned at night by machines, principally in the business district, the best hours being from 10:30 at night to 3 in the morning. Usually, cars are off the streets in the business section during these hours. During the day, in the residential section men are worked in groups, as well as individually. This system has worked very well and little difficulty has been experienced because of parked cars, according to R. H. Clements, Director of Public Works.

In Wilmington, Del., the business section is cleaned at night, as it has been found impossible to clean this district at any other time. The rest of the city is cleaned during the day, flushers being used at night, and flushers and broom gangs during the day. Frank W. Pierson, Street Commissioner, reports that they have been unable to handle parked cars, flushing under them and sweeping around them as well as possible.

Courtland R. Darrow, Superintendent of Streets of New London, Conn., says that for many years horse-drawn sweepers, and later a motor-driven sweeper, were operated, but traffic and parking conditions, even at night, so interfered with the cleaning of the streets that the benefits were not found commensurate with the expense. Hand sweeping is now depended upon entirely.

Main Street, Middletown, Conn., is thoroughly cleaned early Sunday mornings. At other times it is cleaned between the hours of 7 and 9 A. M. and flushing is done from 5 A. M. on. Parked cars give very much trouble at all hours, according to G. Allen Schaefer, Superintendent of Public Works. Local traffic is so light on other streets that little trouble is experienced in street cleaning.

Flushers Used at Night in Hartford

NIGHT street cleaning in Hartford, Conn., is done only on the 46 miles of streets having the more permanent types of pavement. This mileage constitutes approximately 23 per cent of the total. Electric tank truck flushers with the customary gutter men are depended upon for night cleaning work, and this same area is also covered during the day by the single patrol system, averaging ¾-mile per man.

In patrol work, distance rather than area appears to be the controlling factor. Flushing during the day is done only on the occasional warm days of the winter season, when no flushing is done at night. Rotary broom cleaning has not been done for some years, as the problem of parked automobiles is too troublesome.

The secondary pavements in the remaining 77 per cent of the total mileage are cleaned during the day only, by the squad system.

The best hours for street cleaning are from midnight to 7 in the morning, but cleaning is actually started at 7:30 P. M., which is made fairly practicable by commencing on streets where parking is prohibited at all times and on streets which are not popular for parking purposes.

Parked cars are not disturbed for street cleaning, as the flushers can wash under them. On snow work, however, a satisfactory solution has been the placing of "No Parking" signs ahead of the snow loaders. Special care is taken to allow plenty of time to elapse between the placing of the sign and the arrival of the loader. This method has never been resorted to for general street cleaning.

LEON F. PECK,
Superintendent of Streets.

Street Cleaning Begins at Midnight in Coral Gables

ALL street cleaning in Coral Gables, Fla., is done at night, beginning at midnight and continuing until 8 in the morning.

Street-cleaning conditions in this city are not representative of the country as a whole, as the city is unusually clean, there being no manufacturing establishments of any large size and no smoke or soot of any kind, as electricity is used for all heating and cooking purposes. Street cleaning, therefore, is very simple, all of it being accomplished by hand labor at very small expense. While some difficulty is experienced with parked cars, they do not materially inconvenience the cleaning gangs.

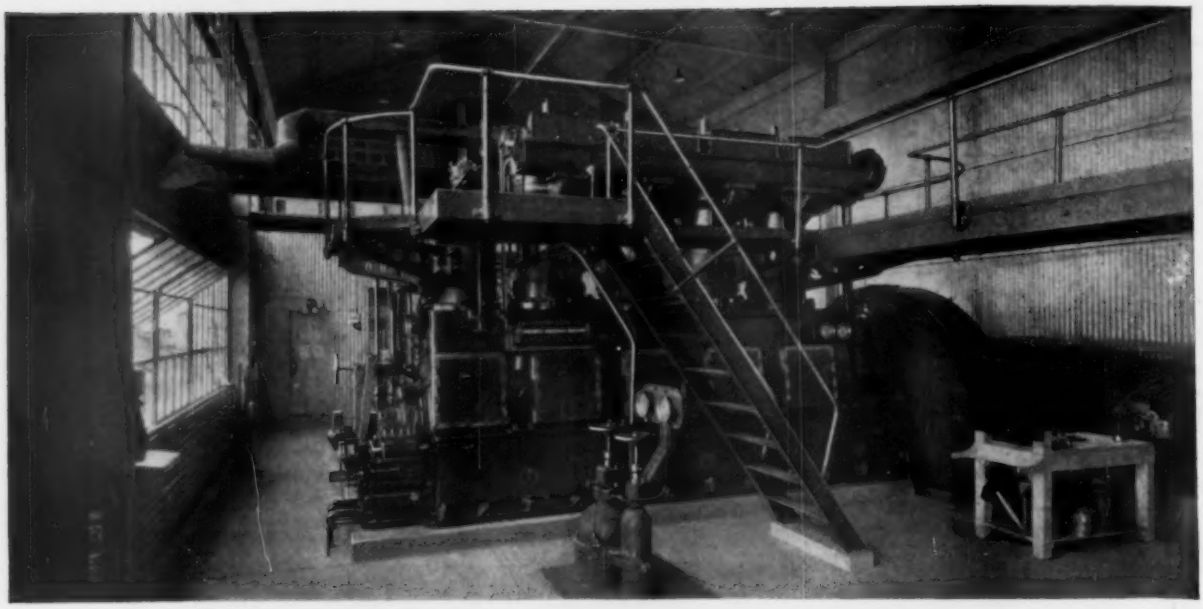
My observation in larger cities has been that the amount of work accomplished by street sweeping during the day is not worth the labor cost. With the proper sort of street receptacles for the trash that is usually dropped on the street by pedestrians, and with an educational campaign, citizens should soon acquire pride in the appearance of their city. It is my opinion that all street cleaning and sweeping should be done after midnight and, if a thorough job is done at night, the streets as a whole should have a fairly presentable appearance throughout the day.

E. FRIEDMAN,
City Manager.

Alameda, Calif.

THIS is a residential city of 38,000 population, built on an island on the continental side of San Francisco Bay, opposite to and about six miles from San Francisco and directly south of Oakland, from which it is separated by an estuary spanned by three bridges and a tube. It has 60 miles of paved streets. An area of 700,000 square yards is cleaned with the annual appropriation of $17,500. One Elgin sweeper and two Ford trucks are used, two push-carts being employed in the business districts. There are nine men employed by the department.

BURNETT HAMILTON,
City Engineer.



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"When the conversion of fuel into power is the consideration, the Diesel engine is more efficient than any other known type of power generator. Aside from its advantages of first economy, the Diesel engine is always to be preferred, if the available supply of water is limited or bad quality; if smoke is a serious objection; if conditions exist where the engine must be started up and put on load quickly."—R. G. Lewis, Prarie Pipe Line Co.

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29 Units were installed in the mid-continent field in 1929 by a single prominent pipe line company.

57 Units are now installed for a pipe line company that has been buying steadily since 1916.

Orders received in the earlier part of 1930 include 28 300-b.hp. units for Gulf Pipe Line Co.; 15 500-b.hp. units for Ajax Pipe Line Co., and a 480-b.hp. and 3 600-b.hp. units for the Texas Company.

OIL pipe line pumping power units must be star performers, because: **First,** the enormous total load demands very high fuel and operating economy. **Second, full load** runs 24 hours per day for days, weeks or even months are common practice. **Third,** capacity decrease or repair shutdown of an active unit is intolerable on account of troubles started elsewhere on the line, and **Fourth,** installing many emergency units at widely separated points costs too much to be commercially practical.

The sustained superior economy, convenience, dependability and long life of the McIntosh & Seymour Engine are largely responsible for gradual transition from steam to Diesel power in this trying field.

It is a safe assumption that prime movers which come through these long heavy runs year-in-year-out with sustained capacity and favorable fuel rate, with little idleness for overhauling and small expense for replacements will do good work **in any stationary service.**

The basic McIntosh & Seymour design has been developed in the light of notable performance records, the material and workmanship are never cheapened, the fixed parts are rugged and virtually indestructible, and the moving parts and wearing surfaces embody every essential for long life and simple replacement.

McIntosh & Seymour Engines are available in types, sizes and speeds for a wide variety of stationary requirements. The recently introduced compact, low-head-room, high-speed types for driving generators are ideal for municipal power stations. Let us submit definite performance figures together with references to early and recent installations.

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McINTOSH & SEYMOUR DIESEL ENGINES

Who's Who among Street Cleaning Officials

One of a Series of Portraits of Engineering Officials Which Has Appeared Monthly Since April, 1928

WILLIAM J. GALLIGAN
Asst. Supt. of Streets
Chicago, Ill.

THEODORE EICHHORN
Supt., Dept. of Streets
Erie, Pa.

ROBERT B. BROOKS
Dir. of Street and Sewers
St. Louis, Mo.

A. J. PAUL
Street Comsr.
Ann Arbor, Mich.

ELMER C. GOODWIN
Examing Engr., Dept. of Sanitation
New York, N. Y.

CARL SCHNEIDER
Aide to Comsr. of Public Property
New Orleans, La.

CHARLES A. HILLEGAS
Supt. of Highways & Sewers
Pittsburgh, Pa.

PHILIP A. MERIAN
City Engineer
New Britain, Conn.

COVINGTON K. ALLEN
Engr. of Street Cleaning
Baltimore, Md.

WILLIAM SYDOW
Supt., Div. of Municipal Wastes, Miami, Fla.

P. J. HURTGEN
Dir. of Public Works
Kenosha, Wis.

JAMES GARBERG
Supt. of Streets
Minneapolis, Minn.

PETER J. OWEN
Supt., Street Cleaning Dept.
San Francisco, Calif.

LIEUT. BERNARDO WOLF
Supt., Div. of Street Sanitation & Cleaning, Havana, Cuba

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Installations made to date prove very decisively the many advantages of the American Chain Tennis Net. It is made by a nationally known concern of high financial standing whose American Chain Link Backstops and Enclosures for Tennis Courts have been standard for many years in the nation's parks, playgrounds and schools.

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American Wire Fence Co., 7 S. Dearborn St., Chicago, Ill.

METHODS of FINANCING PLAYGROUND and RECREATION FACILITIES

Questions That Arise

WELL-ROUNDED programs of public recreation are no longer a matter of controversy. But as to the manner of their financing there is a diversity of opinion and practice. When, recently, THE AMERICAN CITY undertook to analyze current practice among a group of practical, experienced executives in the field of recreation administration, these were among the points investigated:

1. Should the whole program be tax-supported?

2. Should some facilities be free and others charged for?

3. How should fees be established? Should they be based on the theory that anything to be appreciated must be paid for, and made merely nominal? Or, should they be figured to cover the cost of the facility represented? Should they, further, in some cases be figured on a profit-earning basis with the idea that some attractions, intensely popular with certain groups and for which those groups are willing to pay, help support equally desirable, perhaps more widely appealing, pastimes that for one reason or another are not self-supporting?

Allied matters investigated include the public's reaction to the nominal fee practice; what constitutes a nominal fee; and, finally, what is the sentiment of recreation executives and of the public regarding amusement facilities operated in public parks under concessions by concerns in business for private profit.

Points of Policy

PRACTICE in 22 representative cities, to the extent to which it can be generalized, indicates sentiment favoring:

1. A tax-supported or otherwise publicly financed general recreation program developed with special reference to the needs of the child population, with facilities and services provided under supervision, cost-free.

2. Special equipment and facilities in demand by certain groups of the population.

3. These are operated on a cost-covering, or partially cost-covering basis. They include tennis courts, golf courses, swimming pools, boating, etc. It is sometimes found that excessive demand for some of these attractions, regularly, or at certain hours, makes it not only feasible, but desirable to the patrons themselves, to make the charges higher (though never so high as similar attractions operated for private gain). Thus income over and above operating costs is earned and is applied towards financing the general program.

Specific Experience

IN Berkeley, Calif., according to Charles W. Davis, Superintendent of Recreation, the city charges to cover actual cost of the special attraction provided. For example, several tennis courts, operated free during the daylight hours, are lighted by a special meter arrangement for night play. A coin-in-the-slot charge is made for electricity used. There has been no objection to this practice. In fact it is regarded as a special privilege, and it has proved a means of eliminating night service by a supervisor; also it saves electricity because the courts are in darkness when not in use. (Meter boxes are in use for a number of forms of recreation in the Los Angeles County Park system, and there, also, the experience is very satisfactory.) A charge is also made for use of the community houses of the system for evening use for lectures, musicales, and dancing. Three municipal summer camps are operated on a cost basis with very satisfactory results.

In Niagara Falls, N. Y., golf is the only facility for which a charge is made. Fees of 50 cents for 18 holes or $10 for a season privilege cover operating costs. The public recreation is good. In fact, requests have been made from patrons of the bowling-on-the-green and tennis courts that the fee system be extended to these facilities. E. A. Pritchard, Director of Recreation, believes that all special facilities may well be placed on a cost-paying basis, no charge being made for children, for whom special hours are set aside.

Wichita, Kans., St. Joseph, Mo., and Knoxville, Tenn., are among cities where golf and swimming are on a self-supporting basis under a nominal-fee system. In Gary, Ind., these facilities pay their own operating expenses. In Tulsa, Okla., where 50 cents is charged for a round of golf, or $15 for a season ticket, and where there is a 15-cent bathing charge, a profit is realized on both. In Rockford, Ill., golf helps support swimming, while the public is suggesting its willingness to pay higher fees for both. In South Bend, Ind., the fees charged on these privileges are very small and are regarded as mere reservation fees. In El Paso, Texas, while a small charge is made for both swimming and tennis, it is not considered feasible to make these self-supporting.

In Pawtucket, R. I., the popular pastime of boating is self-sustaining. In Elizabeth, N. J., the large swimming pool is profit-making at the low charges of 15 and 25 cents. In Racine, Wis., golf is profit-making. In Wilkes-Barre, Pa., and San Diego, Calif., municipal golf is the only recreation resource charged for.

The Public Is Willing to Pay

GOLFING and boating are self-supporting in Springfield, Ohio. In Duluth, Minn., tennis is almost so, and golf is making an income that is being applied against the capital investment on the course, of $10,000. In East Orange, N. J., night tennis is self-supporting and in the experience of Lincoln E. Rowley, of the Board of Park Commissioners, the public appreciate being able to make reservations in advance by paying a small fee. In Lawrence, Mass., charges for use of the Memorial Park Stadium just fail to cover cost, but sentiment of the High School Athletic Association, the principal user, is for a lower fee. This is the only instance encountered of charges being objected to in any way.

In Long Beach, Calif., Tampa, Fla., Roanoke, Va., Portland, Me., Lansing, Mich., and Lancaster, Pa., all facilities are free. In Long Beach, where the outdoor season extends through a large part of the year, facilities include picnic tables, cooking utensils, gas and hot water, with supervision.

Nominal fees average 50 cents for a round of golf; 25 cents per hour for night tennis; 15 to 25 cents for swimming, exclusive of suits and towels, usually.

A categorical "No" was given by over 95 per cent of recreation officials who expressed an opinion regarding the operation of amusement devices in public recreation areas by commercial concessionaires on a profit-making basis. Most of the conspicuous exceptions to this sentiment were in cases where it was shown that the particular attraction, such as a merry-go-round or roller-skating ring, or winter-sports center, was in demand and could not be publicly provided for want of funds or for other reasons.

But already a new chapter of recreation finance history has opened. "Playland," the Westchester County Park Commission development at Rye Beach, N. Y., plays its important part, rivaling the world-famed commercial amusement center at Coney Island in attractions offered, and providing many other diversions as well, all in a setting of almost ideal beauty and under conditions of supervision hitherto unheard of. That it not only pays its way but helps finance the general park commission budget is a now familiar fact. Its influence was speedily felt elsewhere in a broadened sense of public responsibility for offering, under legitimate conditions and at legitimate prices, attractions heretofore operated for large-scale private gains, and often under doubtful conditions. Other influences are working in the same direction even if in less spectacular and immediately observable ways towards public recreation for everybody; where everybody pays and *gets what he pays for.*

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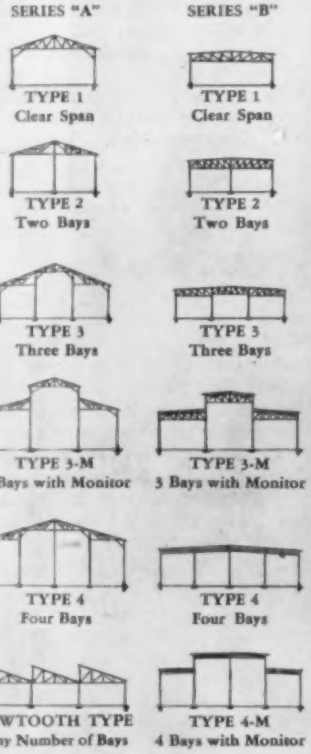

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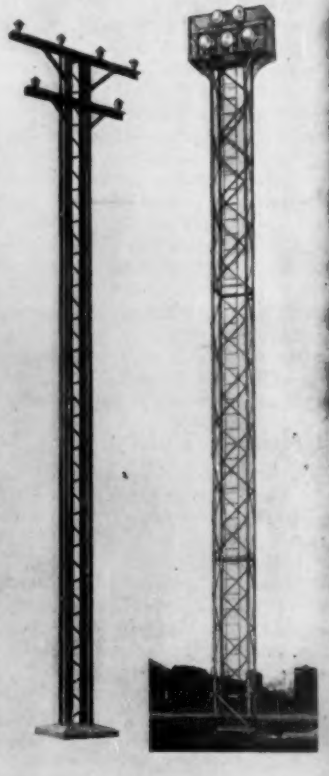

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Truscon Steel Company of Canada, Limited, Walkerville, Ontario

Why not remember to mention THE AMERICAN CITY?

METHODS and COSTS of REFUSE COLLECTION and DISPOSAL

Rules Governing Garbage Collection in Muskegon, Mich.

MUSKEGON, MICH., has formulated a set of 22 rules governing the collection of garbage in that city. These rules, which have been printed on a card and distributed to householders throughout the city, are as follows:

GARBAGE COLLECTORS ARE NOT PERMITTED TO COLLECT GARBAGE IF THE FOLLOWING RULES ARE VIOLATED

1. Garbage shall be placed in garbage cans, not in boxes, baskets, tubs, etc.
2. Garbage cans shall be of a size not larger than 12 gallons.
3. Garbage cans shall have tight-fitting covers that will not leak.
4. The covers must be kept on garbage cans at all times, as garbage must be kept dry so that it will burn.
5. The garbage can shall at all times be kept clean.
6. No slop or liquid of any kind shall be placed in the garbage can.
7. All garbage shall be drained and wrapped in paper. The paper helps to burn the garbage.
8. No tin cans larger than a quart shall be placed with the garbage.
9. Garbage cans shall be left near the rear entrance of the building and at the same place each time.
10. Garbage is refuse from your table and kitchen and does not consists of—plaster—iron—wire—brick—sod—grass—etc.
11. Leaves, trimmings from trees and shrubbery, clippings and rakings from lawns, sod, etc., are not garbage, but will be hauled away by the highway department when placed between the sidewalk and curb—NEVER IN THE GUTTER. If placed on pavement, rain will wash them down the gutter and clog up the sewers.
12. Garbage is burned in the incinerator and non-inflammable material should not be put in the garbage can. Small tin cans and small bottles, however, are allowed.
13. In the winter garbage should be burned when possible, as the incinerator plant is not in operation during the cold months and large quantities of garbage cannot be placed on the dump because of the odor it would create in warm weather.
14. Ashes shall be placed in containers of not more than 1½-bushel capacity and these containers shall be of metal and have handles on both sides.
15. The ash container shall be placed near the rear entrance of the building and at the same place each time—not on the curb.
16. Ashes must not be placed where they get wet, as they freeze in cold weather and cannot be removed from cans.
17. Ashes cannot be burned in the incinerator plant. Therefore, during the warm weather no collection of ashes is made. Collection of ashes in the summer would necessitate going over the route twice, which would practically double the cost of operation of this department.
18. Ashes and garbage are the only two things that the garbage department is permitted to haul.
19. In order to give good service, it is necessary for garbage trucks to follow a schedule. This schedule cannot be maintained if ashes are allowed to accumulate for a long period of time and then put out all at one time for removal. Therefore, the men are instructed to collect only two containers per week from each family.
20. Drivers are not permitted to go inside of buildings to get the garbage or ashes, except in cases where sickness or disability prevents the occupants from placing their garbage or ashes outside. Tips for extra services are not permitted.
21. If you wish to transact any business with the garbage department, please call the office—Telephone 22-163—and do not negotiate with the drivers.
22. A charge will be made at the rate of 40 cents per hour per man for time spent in searching through garbage for lost articles.

I. R. ELLISON,
City Manager.

90 Per Cent of Toronto's Garbage Incinerated

DURING the year 1929, 159,153 tons of garbage was collected in Toronto, Ont., 90 per cent of which, or 141,734 tons, was disposed of by incineration. This is an increase of 6,616 tons over the previous year and is the greatest tonnage incinerated by this department in one year. The average cost per ton from all the plants was $1.22, which is equal to two man-hours of labor per ton. This figure includes the total labor cost, holiday and sick-pay privileges, repairs to plant and buildings, supplies and equipment.

The greatest increase in the tonnage destroyed was shown at the Don destructor, where 36.6 per cent of the total tonnage collected, or 57,728 tons, was disposed of at an average cost of $1.38 per ton. This is the highest tonnage and the lowest cost per ton that the Don destructor has shown in any year since it was placed in operation, in 1917. The guaranteed capacity at this plant is 180 tons per 24 hours, or approximately 36,000 tons per year on a 16-hour day basis. The plant therefore worked 50 per cent over its guaranteed capacity during 1929, which demonstrates the necessity for an additional plant, with the fact that during the past eight years there has been an increase of 21 per cent in the tonnage of garbage collected.

The Wellington destructor disposed of 83,323 tons of garbage, or 52.4 per cent of the total tonnage collected, at a cost of $1.10 per ton, or 1.8 man-hours of labor per ton.

The ash residue from both plants amounts to 11 per cent of the tonnage destroyed.

GEORGE W. DIES,
Street Commissioner.

Eliminating Ash Cans

NO longer is it necessary for unsightly ash cans to appear on the sidewalks of our cities and for clouds of dust and ashes to be scattered over our streets, as well as upon passing pedestrians and automobiles. There is now in operation in New York City a new and patented system which, by means of a powerful suction, carries the ashes from the basements of buildings through a hose or pipe line directly to an airtight steel receptacle mounted on a motor truck for carting away. Even when it is fully loaded, no ashes may be blown from the truck as it passes through the streets because the ashes are contained in an hermetically sealed tank.

The apparatus involves the use of two motor trucks. On one is mounted a 75-horsepower Continental motor operating a multi-stage Triple-A vacuum producer, together with two large dust filters. On the other truck is mounted a large steel receptacle into which the ashes are drawn. This is known as the ash dump unit, and the truck containing the engine and vacuum producer is known as the power unit. When filled with ashes, the ash dump unit is driven away to the point where the ashes are to be dumped, and another empty ash dump unit takes its place, so that there is no loss of time and the system is in constant operation, with the power unit going from one building to another.

Where the system is to be permanently used, a pipe line is installed, extending from the ash pit to the sidewalk. When ashes are to be removed, the truck makes a quick connection to the pipe line at the sidewalk level, and the ashes are drawn up into the truck at a high rate of speed.

This system has been developed by F. C. Allen, Jr., a pneumatic engineer, of New York City, under a basic patent controlled by Charles L. Tolford.

Boulder, Colo., Pays $1,000 Per Year for Disposal

THERE have been no major problems in the disposal of garbage and refuse in Boulder for several years. The city has a contract for $1,000 per year with a collector, who has a hog farm. He feeds what he can and disposes of the rest by other means. The garbage consists of nothing but foodstuffs from restaurants, hotels and private residences. All other refuse is kept separate and disposed of by the citizens, who have it hauled to the municipal dumping grounds.

GEORGE W. TEAL,
City Manager.

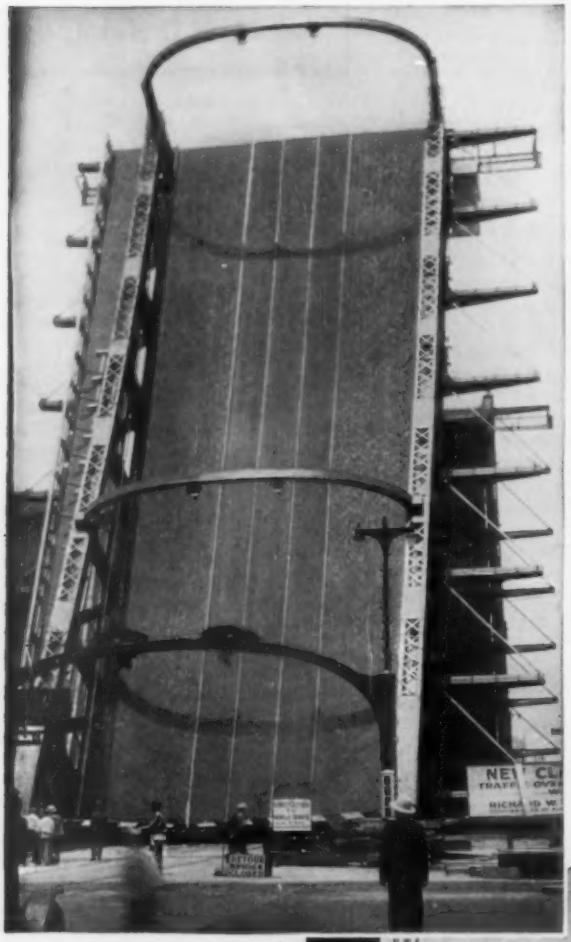
Improvements to Disposal System

IN Lake Charles, La., the collection and disposal of garbage is in the hands of the Board of Health. At present the finances of the city are such that it cannot afford a wagon to pick up soft garbage, although a wagon does take care of the collection of tin cans, covering the city once each week. The greater number of residents pay colored boys to collect the soft garbage, which is fed to hogs.

The city is planning on improvements to the collection and disposal system and as soon as it is able to afford them will make these changes.

H. B. WHITE, M. D.,
City Health Officer.

Once More SERVICISED Fibrated Asphalt Planking Is Selected for a Chicago Bridge



To be a Chicago River Bridge is to have a real job, handling the pound of heavy traffic, with seldom a chance to rest a minute by getting up to stretch.

Some bridges have their choice of traffic, mostly the *bon-ton* kind with soft, speeding rubber cushions for wheels. Not so on Clark Street, Chicago. There, if you are the bridge crossing the main stretch of the river, north and south, you must be tough, strong and patient, with real stability, and with ability to stand the gaff,—the jar and pound, all of every day and night, hour after hour, of thousands upon thousands of wheeled vehicles —all kinds.

There they stream, head to tail,—passenger cars, Fords and rattlers; ten-ton motor trucks and five-ton wagons pulled by two tons of horseflesh; double truck sixty foot street cars with the "hoi polloi" jamming them to the roofs and hanging on somehow. Thud, crash, bang,—sunrise to sunset, sunset to sunrise, and the end of the business day worst of all.

That's why the engineers said, "Put Servicised Fibrated Asphalt Planking on Clark Street Bridge." It will stand the gaff. It's not slick or slippery; it's waterproof; it deadens noise and vibrations; it's economical, wears a long time and smooths out and heals itself under traffic.

And the new Clark Street Bridge will have an easier time than the old one, though it must take more abuse, all because it's covered with Servicised Fibrated Asphalt Planking.

The makers will be glad to tell you more about it.

SERVICISED QUALITY PRODUCTS

Expansion Joints
for Roads, Streets, Sidewalks, Buildings
Fibrated Asphalt Plank
for Bridges, Runways, Platforms
Highway Crossing
Rail Filler and Track Insulation
Sewer Pipe Jointing
Industrial Flooring
Waterproofing

SERVICISED PREMOULDED PRODUCTS, INC.

53 West Jackson Blvd., Chicago, Ill.
GENERAL DISTRIBUTORS For Products Manufactured By
Factory 6051 W. 65th St. CHICAGO, ILLINOIS
SERVICISED PRODUCTS CORPORATION
REG. U.S. PAT. OFF. © 1918
DISTRIBUTORS and DEALERS IN PRINCIPAL TRADING CENTERS

Construction and Maintenance

Engineering and Highway Departments

Finishing Machines for Bituminous Pavements

THE great increase in the use of finishing machines for finishing bituminous surfaces on both state highways and city work, has largely been due to the saving in labor and the better quality of the finished work. Not only has machine finish made asphaltic roadways more accurate as to riding surface and crown, but it has also provided a more even distribution of material, thus improving the quality of the pavement.

It appears that any mix that is suitable for hand raking can easily and successfully be finished by machine. At present, machines are operating where various sizes of plants are in use. Some of the larger plants have a capacity of 900 to 1,000 tons per day. The greater number of machines have been used on plants having a capacity of 250 to 450 tons per day.

As an example of the use of a finisher installed after a job was in progress, the average production for 19 days of hand raking was 1,400 square yards per day, against an average production, to the completion of the job, of 14 days of 2,300 square yards with the use of the finisher, which also eliminated the use of four rakers. The plant in this case has a pugmill capacity of 800 pounds.

The saving in labor where machine finish is used is obvious. Only one back raker is necessary, although where spreader boxes are not used, as in the case of small plants, the usual number of shovelers must be retained. The use of spreader boxes will eliminate all but one shoveler, although two men must be used to operate the boxes.

As an example of the saving due to decrease of labor with the finisher, the following is the crew used on a job of resurfacing an old macadam road, before and after a finisher was installed:

Crew Used on Binder Course	
Hand Raking	Machine Finish
1 foreman	1 foreman
10 shovelers	4 shovelers*
1 tamper	1 tamper
1 truck dumper	1 truck dumper
4 rakers	1 back raker
2 roller men	2 roller men
19 total	10 total

Crew Used on Top Course of Sheet Asphalt	
Hand Raking	Machine Finish
1 foreman	1 foreman
10 shovelers	4 shovelers*
4 rakers	1 back raker
2 strike-off template men	1 steel strip carrier
	1 truck dumper
2 tampers	1 machine operator
1 truck dumper	2 roller men
2 roller men	11 total
22 total	

* In this case the end-gates of the trucks were tied and the material partly spread by the trucks.

The machine must, of course, be run upon forms of strength and contour sufficient to support it. Where a concrete base is already in place, the machine is operated on the edge of the concrete header. Too much emphasis cannot be placed on the careful setting of the forms, because they are the governing factor of the smoothness of the finished pavement. Where the finisher is operated on concrete headers, the headers should be straight-edged to the required smoothness of the finished pavement. It is recommended that steel strips be placed on wood forms when a finisher is used, to guard against possible damage to the form from the sliding action of the screed member, as well as to bridge any irregularities in the forms themselves.

—From a paper read by C. L. Donovan of the Lakewood Engineering Co., before the Engineers Club of Philadelphia, Pa.

LAYING TYPE M-4 COLD MIX IN NEW YORK STATE

Jamaica Spends $1,000,000 Annually on Road Construction and Maintenance

JAMAICA, an English possession, has a highway system which is almost entirely constructed of waterbound macadam, some 70 miles of which has been surface-treated. Many of the roads are under the supervision of the Department of Public Works and various parochial boards. There are about 2,500 miles of bridle- and foot-paths. The highway system connects all parts of the island in a very satisfactory manner, and the problem is not that of the construction of new roads, but the improvement of old ones, the surfacing and widening of these roads, and protective coatings. The roads are well maintained and, as there are not many heavy trucks, the maintenance is satisfactory.

Jamaica has about 953,968 inhabitants and an area of 4,450 square miles, giving a population of approximately 214.4 per square mile. There are approximately 4,000 miles of highways, or 1.11 square miles of area to one mile of highway.

About a million dollars per year is spent on new construction and maintenance, the machinery used being both European and American. There is an import duty on all machinery, with a 5 per cent differential for the benefit of England and Canada. The sources for road funds are taxes on horses, animals, carts and wheels, and motor-vehicle and registration fees. Within the city there is also a tax on land.

—From a report of the American Road Builders' Association.

Gravel Streets in Flint

SLIGHTLY over 15 miles of gravel streets were built during 1929 in Flint, Mich., this being practically the same mileage as in the previous year. The costs per front-foot assessment, however, were reduced from $1.32 to $1.10, on which a rebate of 32 per cent was applied for 1929, against 20 per cent for 1928. Accurate records of grading costs were kept for 1929, with a result which compared very favorably with the cost of similar work done by contractors.

It has been found that gravel roads are very good temporary relief measures for districts which have no storm sewers. To date, they have provided a very satisfactory means of access to these districts when roads would otherwise be impassable, and they form an excellent link between the unimproved dirt street and the permanent pavement.

H. C. McCLURE,
City Engineer.

PERFECT PROTECTION FOR FOUR YEARS

FIRE DEPARTMENT
EDWARD F. DAHILL
Chief of Dept.

CITY OF NEW BEDFORD
MASSACHUSETTS

July 30, 1930

The Gamewell Company
Newton,
Mass.

Gentlemen:

Ten years ago we installed our first master box connected direct to a sprinkler system. Today we have eighteen Gamewell boxes connected to sprinkler systems and all have given satisfactory service. We have not received a single false alarm from any of these boxes for over four years.

We recommend the installation of Gamewell Master Boxes connected to sprinkler systems.

Yours truly,

Edw. F. Dahill

Chief of Department.

The Gamewell "Sprinkler Watchman" consists of a standard fire alarm box (Master Model). By attaching this box to the municipal fire alarm system on one side and to the riser or risers of a sprinkler system on the other side, the most direct, efficient, and economical sprinkler supervisory service is provided.
A list of cities where the Gamewell "Sprinkler Watchman" is in service will be sent upon request, along with complete details of how the system operates.

"A BOX A BLOCK"

GAMEWELL SPRINKLER WATCHMAN

THE GAMEWELL COMPANY
NEWTON · · · MASSACHUSETTS

Police—Traffic—Safety Items

of Interest to Departments of Public Safety

The Size of Police Departments Compared with Population Figures

THE number of police department employees, including civilians as well as the uniformed force, for all departments where civilians also are employed, ranges from an average of 1,257 for 30 cities of over 200,000 population to an average of 16 for 247 cities of 10,000-25,000 population. The average is 209 for 37 cities in the 100,000-200,000 group; it is 88 for 62 cities of from 50,000-100,000, and 43 for the 115 cities in the 25,000-50,000 group for which new census figures were available.

These averages have been computed from figures published in the July number of *Uniform Crime Reports*, issued by the Committee on Uniform Crime Records of the International Association of Chiefs of Police. The figures present, for the first time since the collection of uniform crime reports begun in January, 1930, the number of police department employees in cities of 10,000 population and over, according to the 1930 census. Because the latest census data were not entirely completed when this list was compiled, it was necessary to omit cities for which the 1930 population figures were not available. In a few cases cities were omitted because they failed to specify the number of police department employees on the monthly return forms sent out. A number of departments, while giving the information for one or more months, failed to submit it each month, and for this reason a representative figure has been selected for these cities, based on either the predominating figure entered each month from January to June inclusive, or on an average taken from such entries where there is a slight variation from month to month.

The first group, cities having a population of over 200,000, includes Chicago, with a force of 6,645, Detroit, with 3,990, and Philadelphia with 5,483. Among the large cities not included are New York, Los Angeles, Pittsburgh and San Francisco. Boston has the largest police force in relation to its population of all the cities listed in this group, with a figure of 3.3 per 1,000 population, while Akron, Ohio, has the lowest, with 0.7 per 1,000. The largest number of police department employees as compared with the number of citizens in the 100,000-200,000 class is found in Hoboken, N. J., where 3.7 persons in every 1,000 are members of the police force; the lowest figure is 0.6, held by both Binghamton, N. Y., and Lincoln, Nebr. The highest and lowest for the 115 cities having 25,000-50,000 population are 3.4 for Kearny, N. J., and 0.6 for Enid, Okla., and New Albany, Ind. In the group of cities having 10,000 to 25,000 population, the variations found range from 4.2 per 1,000 population in Hopewell, Va., to 0.4 in Bismarck, N. Dak., Cambridge, Ohio, Carbondale, Pa., Dubois, Pa., Moundsville, W. Va., Sumter, S. C., and Uniontown, Pa.

AN INSURANCE COMPANY POSTER IN THE INTEREST OF TRAFFIC SAFETY

Regional Conferences Study Automobile and Airplane Transportation

WITH the cooperation of the Philadelphia and Boston Chambers of Commerce and of the Aeronautical Chamber of Commerce of America, the first two of a series of eight regional conferences to study the problems of automobile and airplane transportation from both a local and a national point of view were held in Philadelphia on September 23 and 24 and in Boston on September 25 and 26.

The conferences have been arranged by the Chamber of Commerce of the United States, and were inspired by inquiries from many chambers of commerce and business organizations with regard to the development of aviation, vehicle legislation and regulation, safety and accident prevention, and facilities for traffic on the streets and public highways. Public traffic officials, members of the National Conference on Street and Highway Safety, and aviation experts attended the Philadelphia and Boston sessions and participated in the discussions with local representatives and delegates of civic and business organizations. The meetings have been designed primarily to enable business organizations and business interests of the country to approach and consider their local and regional street and highway and their air-traffic problems from the standpoint of a national perspective, and to facilitate the exchange of views and experience in these matters from both a regional and a nation-wide point of view. Uniform legislation, efficient use of ground and thoroughfares, proper regulatory measures, safety education and long-term planning, for both air and motor travel, are among the subjects of discussion.

A conference similar to those held has been scheduled to meet in Chicago on November 5 and 6 for the states of Illinois, Indiana, Iowa, Kentucky, Michigan, Missouri, Ohio and Wisconsin, and one in Minneapolis on November 7 for the states of Minnesota, Montana, North Dakota and South Dakota. In November also the southeastern states will have a conference in Atlanta, and the southwestern states will have one in Dallas. Two other conferences for the Rocky Mountain and Pacific Coast states will be held in December.

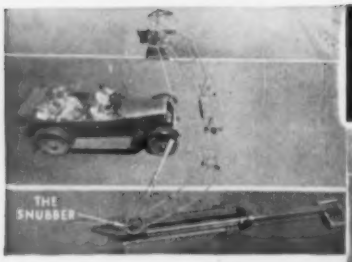
Fewer Accident Deaths in Four-Week Period Than a Year Ago

FIFTY-SIX fewer deaths from automobile accidents occurred in 78 large cities in the United States during the four weeks ended September 6, 1930, than during the four weeks ended September 7, 1929. The 1930 figure of 659 is compared with 715 for the equivalent period in 1929 by the Department of Commerce in its latest summary of mortality from automobile accidents.

Although the total number of deaths due to motor-vehicle accidents in the 78 cities was 7,057 for the 52 weeks ended September 6, 1930, as compared with 6,732 for the previous 52 weeks, 32 of the 78 cities reporting had fewer accidents in the later period. These cities include Akron, Baltimore, Boston, Bridgeport, Camden, Canton, Duluth, Jersey City, Kansas City, Kans., Knoxville, Louisville, Lynn, Memphis, Milwaukee, Minneapolis, New Bedford, New Orleans, Paterson, Philadelphia, Portland, Ore., Providence, St. Louis, San Antonio, Syracuse, Trenton, Utica, Washington, D. C., Waterbury, Wilmington, Del., Worcester, Yonkers, and Youngstown.

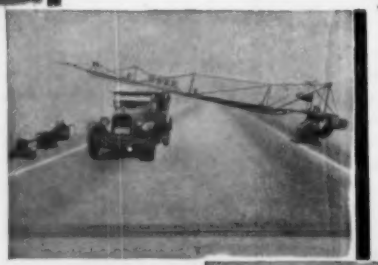
A Modern Grade Crossing Protector for the Modern Highway

THE CROSSING GATE THE MOTORIST CANNOT CRASH



At the moment of contact with the barrier, the wire rope gives an even bearing against the car. The snubber has not started to act.

Compare the position of the snubber in this picture with its position in the illustration above. Here the snubber has moved to take up the shock.



If a lowering barrier comes in contact with the roof of a car it causes no damage. A pressure of 5 pounds stops its motion instantly.

Caught between lowered barriers, a vehicle can push a barrier out of the way and drive to safety. The barrier then closes and locks over the snubber.

ORDINARY crossing gates and roadside signals are no longer capable of providing the necessary safety to the 27,000,000 motorists traveling our highways.

Such old methods are inadequate. They were built for an age that is past. Motorists continue to crash through old-fashioned wooden gates, and ride by signals. The toll in fatalities and damaged property continues to increase at an alarming rate.

No adequate means of protecting crossings, at a cost within reason, was available until THE HIGHWAY GUARDIAN was developed. Now, with this new safety barrier, traffic is stopped by force when necessary. It saves the motorist from his own rashness and carelessness. It puts a stop to fatal accidents, prevents car wrecks and eliminates train delays.

When considering highway improvements, make grade crossings as modern as the new roads you construct. Install THE HIGHWAY GUARDIAN. It costs but a fraction of the expense involved in grade separation. It makes thorough protection of a greater number of crossings possible without increasing expenditures.

Write for complete details of THE HIGHWAY GUARDIAN'S construction and operation.

◆

The fundamental idea from which THE HIGHWAY GUARDIAN has been developed was the ingenious conception of Mr. Joseph B. Strauss, eminent consulting engineer and builder of many of the world's famous bridges.

◆

FRANKLIN RAILWAY SUPPLY COMPANY, Inc.

NEW YORK CHICAGO
SAN FRANCISCO ST. LOUIS MONTREAL

THOMAS C. WILCOX
Police Commissioner
Detroit, Mich.
(Appointed 1930)

J. F. LAMBORNE
Police Chief
Bellefontaine, Ohio
(Appointed 1906)

GEORGE E. GILLASPY
Police Chief
Council Bluffs, Iowa
(Appointed 1930)

CAESAR J. SCAVARDA
Police Chief
Flint, Mich.
(Appointed 1927)

KARL A. WEANER
Police Chief
Defiance, Ohio
(Appointed 1924)

Who's Who in Public Safety

The 34th of a Series of Portraits of Fire and Police Chiefs Which Has Appeared Monthly Since January, 1928

CHARLES J. BRENNAN
Fire Chief
San Francisco, Calif.
(Appointed 1929)

SAM HUNT
Fire Chief
Jacksonville, Ill.
(Appointed 1925)

FRANK F. DICKINSON
Fire Chief
Brockton, Mass.
(Appointed 1928)

F. P. CULP
Police Chief
Fostoria, Ohio
(Appointed 1927)

GEORGE ABELE
Police Chief
Springfield, Ohio
(Appointed 1928)

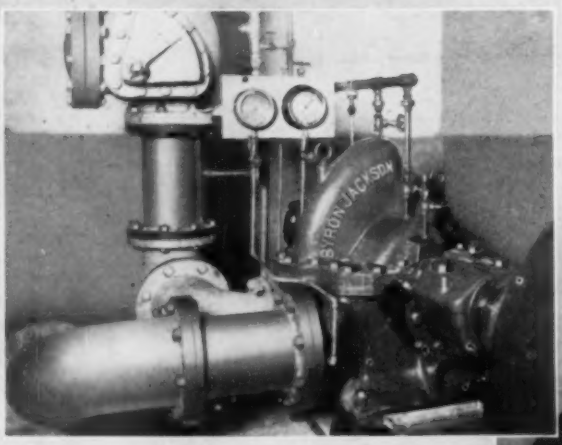
W. G. BARROWS
Police Chief
Cleveland Heights, Ohio
(Appointed 1920)

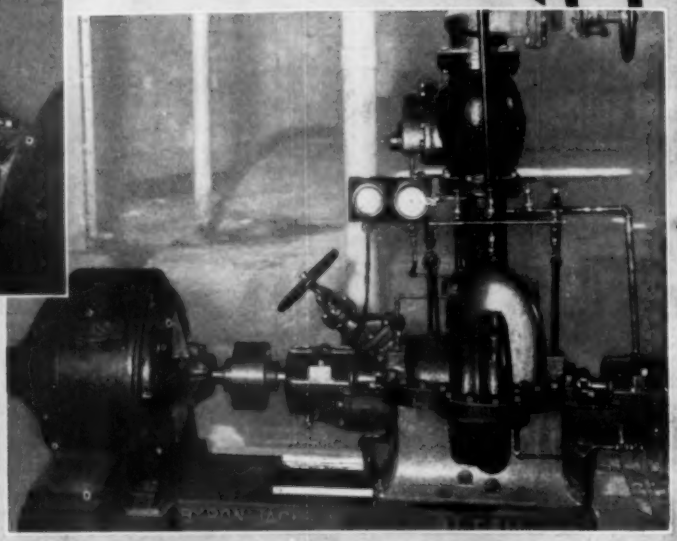
LOUIS REICH
Fire Chief
Riverdale, Ill.
(Appointed 1929)

JOHN A. SAVAGE
Fire Chief
Valley Falls, R. I.
(Appointed 1929)

J. J. KUPLIC
Fire Chief
Manitowoc, Wis.
(Appointed 1926)

HIGH PRESSURE FOR WATER WORKS





Byron Jackson Multiplex Pumps are shown delivering water direct from bored wells into city mains. Ordinarily deepwell turbines are installed to raise the water from the wells and discharge into a multiplex pump for the necessary pressure boost into the mains. In the locality in which these pumps are installed the water table remains practically constant and there is no danger of the water falling below the suction reach of the pump or rising up and flooding the pit. Wherever such water conditions prevail, Multiplex or Type "S" Centrifugal Pumps in the pit make an excellent installation.

SINCE 1872

BYRON JACKSON CO.

Factories: BERKELEY, Los Angeles, Visalia, Calif.

Branches: NEW YORK and CHICAGO

San Francisco, Portland, Salt Lake, Tulsa, Dallas, Phoenix

BYRON JACKSON

CENTRIFUGAL PUMPS FOR EVERY SERVICE

OCTOBER, 1930
Vol. XLIII, No. 4

The American City

470 Fourth Avenue
New York
50 Cents, $4 a Year

The Mount Vernon Memorial Highway

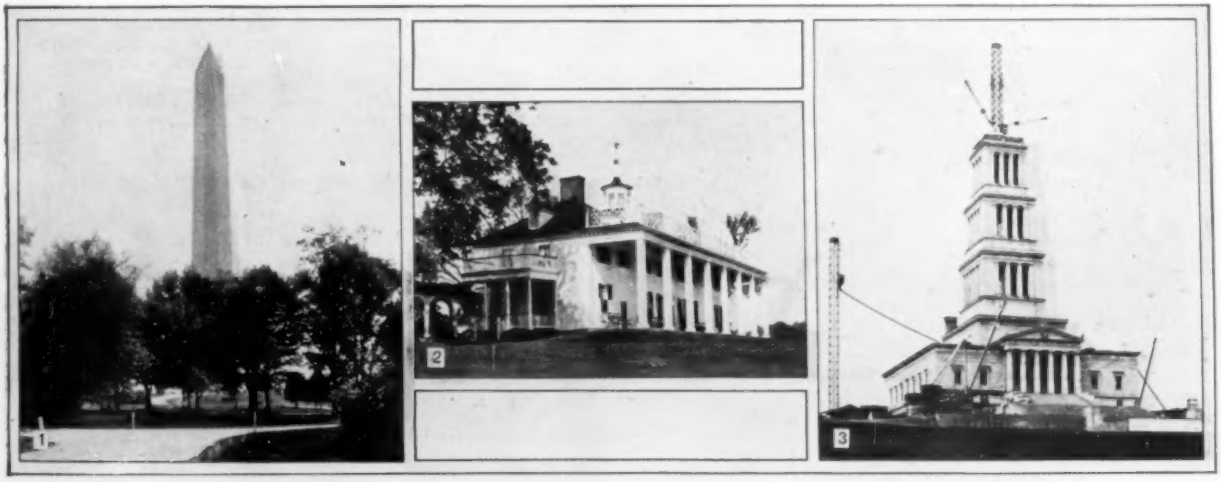
Most Modern Motorway, Designed as a Memorial to Country's First President, Now Under Construction

By **WILBUR H. SIMONSON**
Landscape Architect, U. S. Bureau of Public Roads

GEORGE WASHINGTON was a great planner and a far-sighted leader in the development of the transportation of his day. This is evidenced in the early canals constructed by him, the remains of some of which are still extant along the shores of the Potomac River. Transportation is unquestionably one of the big tests of the economic progress of our national life. What could possibly be more fitting as a memorial to our first president, in whose honor our capital city was named, than the most advanced type of highway development that this country can command.

Prior to 1892, when the Mount Vernon Electric Railway laid its tracks, water transportation by steamboat down the Potomac still continued to be the best means of making a pilgrimage to Mount Vernon. Although it was the better part of a day's journey, it was very comfortable and quite delightful. The boat ride was much more restful than the long 16 miles through back country on horseback, or in carriages over either muddy or dusty dirt roads. A suitable direct roadway approach to Mount Vernon was not developed until the tourist influence of the automobile age made itself felt. The old trolley line of the early nineties could not long withstand this newer economic competition of improved mobile transportation. After nearly forty years of faithful but diminishingly useful service to the public, the electric railway line was abandoned and torn up early this year to make way for the construction of an improved highway to commemorate the 200th aniversary of the birth of George Washington.

Highway building has proceeded along almost the same lines as railway building. The things of early years were done cheaply and sufficed for the light traffic of the



AT THE DEDICATION OF THE MOUNT VERNON MEMORIAL HIGHWAY IN 1932, THE THREE GREAT MEMORIALS TO GEORGE WASHINGTON WILL BE COMBINED IN A UNIFIED GROUP

The Washington Monument at the Washington, D. C., end of the highway. 2. A riverfront view of the home of George Washington at Mount Vernon, Va., the present southern terminus of the Memorial Highway. It will be possible to extend this beautiful drive farther south along the broad Potomac River through historic Virginia to include the birthplace of George Washington at Wakefield, and to Jamestown, Yorktown and Williamsburg, the "Cradle of the Nation" being restored to the public through the generosity of Mr. Rockefeller. 3. The George Washington Masonic National Memorial in Alexandria, Va. This is the mid-point of the highway between Washington and Mount Vernon. This recent photograph shows the rapid progress being made in the construction of this Memorial Temple, which will be completed in time for dedication during the Bicentennial Celebration in 1932

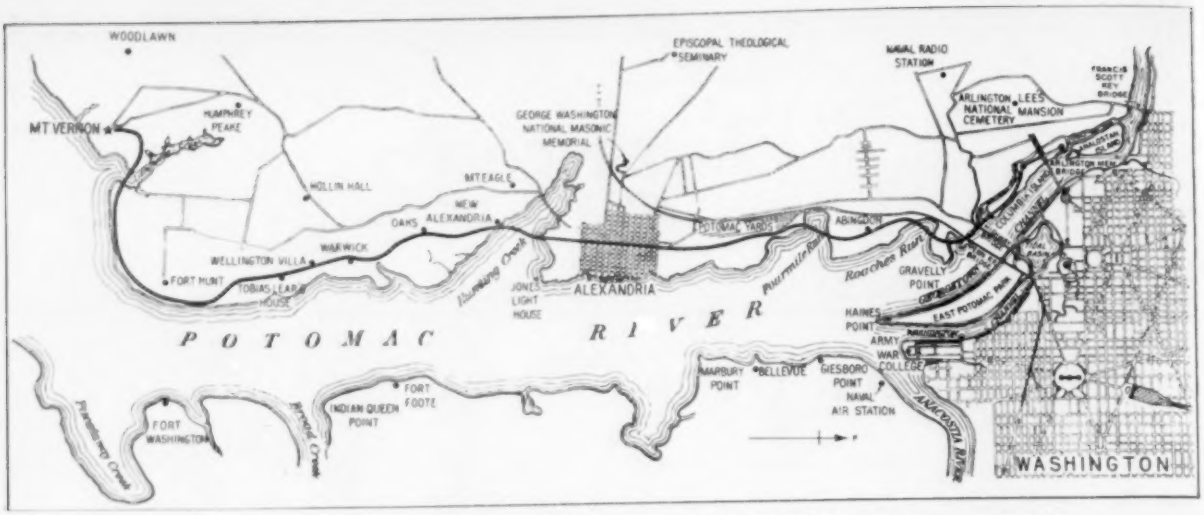


DIAGRAM SHOWING THE RIVERFRONT LOCATION OF THE MOUNT VERNON MEMORIAL HIGHWAY
This highway extends from its north end at the Arlington Memorial Bridge, south through the historic city of Alexandria, Va., to the estate of George Washington at Mount Vernon, a distance of 15½ miles

STUDIES FOR TRAFFIC RELIEF—WASHINGTON, D. C., TO MOUNT VERNON, VA.

Tabulated Comparison of Routes

Item	Old Existing Highway to Mount Vernon	Modern Memorial Highway Now Under Construction
1. Distance from the Virginia end of highway bridge in Washington to the Mount Vernon gate entrance	13¼ miles	14½ miles Note: Although a mile longer, traveling time will be much reduced on this high-speed grade-separated pavement.
2. Riverfront	None	12 miles
River views and scenic advantages	One crest affords a hilltop view of valley, but uncontrolled	A riverfront drive affording panoramic river-scenery and frequent unusual and surprising distant views for miles up and down the Potomac River
3. Number of traffic lanes	2 and 3	4 and 6 and 8
4. Widths of pavement surface	18 feet and 20 feet (1 mile of 30 feet recently completed)	40 feet and 60 feet ultimately (1 mile of 2 split 40-foot through grade-separation structures)
5. Number of grade separations	2 railroads	1 railroad, 4 highway (primary)
6. Existing road intersections at grade (excepting Washington streets)	33 (not including many additional driveway entrances)	6 specially designed "safety-flare" widenings; 4 minor dead-end local connections. No private drives
7. Types of traffic	Mixed slow and fast traffic.	Segregated fast through traffic only
8. Separate parallel service streets	None	Border roads at North Alexandria and Wellington to serve local frontage and afford easy access to highway at desirable places
9. Lighting	None. Glaring headlights necessary for night driving. Strain on narrow pavement	Artistically planned to make highway safe and restful for recreational driving at night
10. Guard-rails	Assorted types, insufficiently placed	Uniformly attractive, befitting the roadside
11. Side ditches	Dangerous	None
12. Shoulders	Various widths and surfacings	Turfed, 3 feet in cuts; 6 feet in fills
13. Slopes	Usually steep and rough in finish	2: 1 or flatter; rounded at top
14. Curbing	None	Special section 4 inches high with frequent drain-inlets incorporated (except on causeways)
15. Number of gas stations (excepting in Alexandria, Va.)	25	None
16. Roadside stands and refreshments booths	10	None
17. Number of dangerous sharp corners or bends in pavement	9	None
18. Number of curves sharper than 800-foot radius	26	None
19. Number of utility poles along both sides of highway	1243 Note: This is 100 per mile, or an average spacing of 50 feet apart	None
20. Number of advertising signs and miscellaneous billboards	611 Note: This is 50 per mile, or an average of 1 every 100 feet	None

time. As certain originally local lines developed into trunk or through-traffic arteries, there came the pressing need for revised location, improved construction, elimination of dangerous grade-crossing points, and a greater capacity for real service to the public through the elimination of needless delays and through advancement in safety and comfort. The rough product of the pioneering days is constantly being transformed into the more pleasing and refined development of the present age. The nation, upon the completion of this memorial highway, will proclaim the practical wisdom and sound sense of combining beauty with utility in our road building.

In 1924 a commission was appointed to prepare for the bicentennial celebration of Washington's birth. The city of Washington is a beautiful metropolis, residential in character. It has very little of an industrial or commercial nature within its borders. Upon leaving the capital by motor to reach the nation's shrine at Mount Vernon, however, the visitor must follow the existing highway through an intensely developed commercial area. Both sides of the road are bordered by industrial plants of various sorts. Coal yards, brick plants, oil-storage tanks, freight sidings, and other manufacturing and business establishments, are passed in review. Gas stations of all descriptions are scattered *ad libitum* along the way. Literally hundreds of advertising signs and unsightly billboards imprison the tourist as he rides. Old discarded auto-busses have been transformed into so-called eating-places. Wooden poles, as numerous as the pickets in a fence, flash rapidly by. It is not economically wise to attempt to change or radically modify such an existing situation. It is natural that commerce and industry should

"BEFORE AND AFTER" VIEWS OF THE MT. VERNON TERMINAL DEVELOPMENT

(No. 1, above)—The approach to the north-entrance gate at the Mount Vernon estate as it appeared in 1930. The last trolley car to use these tracks is shown standing before the existing old trolley station. Operations to clear this terminal area of its tracks, poles and wires were begun on the 1st of March. The limited parking facilities for cars and busses may be seen at the left of this picture. It was this haphazard and inadequate terminal situation, so inappropriate as an approach to the nation's shrine, that caused Congress to authorize the construction of the Mount Vernon Memorial Highway

UNDESIRABLE CONDITIONS ALONG THE PRESENT ROAD TO MOUNT VERNON

Observe the dangerously awkward curves in the pavement, the poorly located, unattractive gas stations, the unsightly billboards and the many utility poles dominating the scenery along this existing highway. Note the steam shovel beginning operations to improve the dangerous traffic situation

(No. 2, above)—An air view showing the well-organized traffic approach to the Mount Vernon entrance gate as it will appear in February, 1932. All facilities for accommodation of the visitor are greatly enlarged. Formal parking for 350 automobiles at one time is shown on the left, and space for more than 60 sightseeing busses is provided on the right.

Overflow parking for over 5,000 cars in adjacent wooded areas is available for large crowds. The planting of native shrubs in informal masses and the careful placement of large trees will screen these service areas so that the parked automobiles will not be immediately apparent to the visitor as he approaches Mount Vernon.

The subordinated position of the concession building to provide for the various needs of the visitor may be seen to the right of the north-entrance gate, which is the focal point of the whole design. The large trees within the oval will be moved in next winter and will be dedicated as Washington Memorial Elms on February 22, 1932. The general landscape treatment will be in entire harmony with the character and spirit of the Mount Vernon estate itself.

take the line of least resistance, and, if uncontrolled, spot their interests ribbon-like along our transportation arteries. For really effective economic improvement, recourse lies in pioneering an entirely new route through the less expensive areas of development that are quite removed from the beaten path of man-made civilization.

With this principle in mind, Congress on May 23, 1928, passed an act authorizing the Bicentennial Commission to select, construct and maintain a highway to Mount Vernon that would be appropriate and fitting as a memorial to George Washington.

A Scientific Achievement

To the Bureau of Public Roads in the Department of Agriculture was delegated the task of planning and designing this memorial highway. After considerable and very careful study of all possible routes, a tentative selection was reported on January 24 of the following year. Final location plans and details for construction were well under way in May, 1929, just a year after the authorization by Congress. The detailed plans and specifications were completed by the first of last November and the contracts awarded in January of the present year. These contracts comprise a very interesting group of twelve stone-faced bridges, most harmonious in design, together with the plans for the hydraulic fills and the rough grading and drainage work which are now in progress over the entire fifteen miles of construction. In spite of the very difficult engineering problems involved in the limited time of two brief years allowed for its completion, the fullest cooperation of everyone connected with the work will enable this Memorial Highway to be dedicated in 1932 as an illustration of efficient engineering skill and experienced and well-qualified contracting organization.

The great attractiveness of motoring has always been and still is its pleasure-giving quality. There is a pressing need for really attractively designed highways that will stay attractive in appearance and usefulness always. The preservation of natural beauty for the enjoyment of the public is a governmental duty. For this reason, the Memorial Highway has a right-of-way with a minimum width of 200 feet, which widens out in many places to include the desirable and worth-while natural features that should be preserved along its sides. These widenings protect the charming outlooks upon the majestic Potomac for public use and enjoyment forever. This effective border control will insure the unhampered development of the natural scenery through which the roadway passes. As a barrier, it will prevent the introduction at any future time of incongruous objects that would be foreign to the natural beauty of its wonderful setting on the westerly bank of the broad Potomac.

The trend of the times is for increased speed upon our highways. Congestion of traffic in metropolitan areas is becoming unbearable and costly with the delays involved. Even Washington is no exception to this general tendency that makes of motoring a distraction rather than a pleasure. Beauty and utility, however, have been so combined in the design of the Memorial Highway that motor travel to Mount Vernon should become as stimulating to the eye as it is the speedometer. Long, straight lines, with their usually ugly gashes through hillside or valley, have been avoided. In their stead have been substituted very generous sweeping curves to conform to the gently rolling countryside of historic old Virginia. Transition spirals or long easements have been incorporated liberally in the improved and perfected alignment. The sharpest curve is slightly under 1,000 feet in radius. In like manner, the profile fits the country through which it passes with a most careful regard for appearance, keeping in mind the effect it would have upon the gracefully finished slopes. The pavement will be super-elevated on all curves up to 6,000 feet in radius for a speed of 30 miles per hour to make travel pleasant for the motorist. As the splendid river vistas and other delightful views progressively unfold mile after mile without interruption, the parklike atmosphere of Washington will be extended to the very doors of Mount Vernon.

To insure an uninterrupted flow of traffic and the full use of the pavement, a number of important grade crossings are eliminated. All bridges and culverts are of reinforced concrete faced with native color-blended stone to harmonize with the natural surroundings, with the exception of the Fort Hunt overpass, which is a brick-faced structure to conform with the colonial brick fortresses of historic Fort Washington directly across the river. The bridge structures are unique in design as the result of the collaborative efforts of the consultant landscape architect and the Bureau's structural design engineer.

Motorist Convenience

The number of access connections to surrounding land areas has been reasonably restricted to promote speed with safety. They are spaced an average distance of about 1½ miles apart and in most cases have been so located as to eliminate all left-hand turns and thus reduce to the very minimum the number of actual crossing or danger points. In a few less important intersections, special "safety-flare" widenings with central islands have been incorporated in the design in lieu of grade-separation structures that would be extremely expensive as well as unsightly and unnecessary at these localized secondary points. Also, generous and frequent widenings in the pavement proper have been placed at especially desirable "overlook" locations where automobilists may pull out of the direct line of traffic and enjoy a restful panorama of the river in perfect safety. In a similar manner, unique "bus-widenings" have been designed at convenient intersection points to provide loading and unloading stations off the line of fast traffic for the express busses that may use this highway under special restrictions or limitations for the convenience and safety of the public.

One of the most difficult problems in this day and age is the adequate provision for automobile parking facilities. Almost everyone who visits Mount Vernon today goes by motor, either in his own car or by sight-seeing bus. Considering the limited area available at the Mount Vernon approach, this was a most complicated problem. It is rather difficult to incorporate storage facilities for a "sea" of auto tops and prevent such service vehicles from dominating the scenery. The terminal area has been developed, however, to fit the ground surface and to preserve all existing shrub and tree growth possible. This material will form the basic foundation for additional planting along the borders to screen the parking spaces effectively. All service-areas and facilities are thus subordinated to the prime objective—the entrance to the home of George Washington. The simple dignity of the design will lure the visitor within the walls of the nation's shrine, there to breathe in its charming beauty and sacred atmosphere.

MENOMONEE RIVER PARKWAY
This is the first unit in Milwaukee's 84-mile county parkway system. The view is south from Burleigh Street

Fifteen Years of City Planning Accomplishments in Milwaukee

By **CHARLES B. BENNETT**
City Planning Engineer, Board of Public Land Commissioners, Milwaukee, Wis.

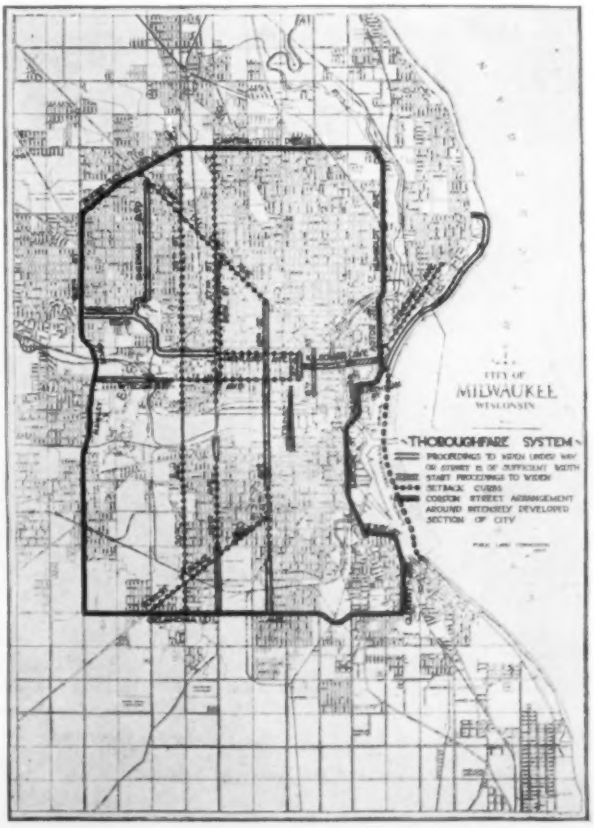
IN the year 1915, the Common Council of the city of Milwaukee created the Board of Public Land Commissioners to act as the official planning body of the city. It is composed of the commissioner of public works and the city engineer, ex-officio, and three citizens appointed by the mayor for three-year terms, subject to the approval of the Common Council. While the Council retains final jurisdiction, all matters relating to the physical layout and additions to the city are submitted to the Board for recommendation. These include the acceptance of plats within one and one-half miles of the city limits, the acquisition of land, amendments and additions to the zoning ordinance, matters pertaining to the civic center, street widening, and general city planning problems. The Board also functions as the real-estate department of the city and acts as the real-estate agent of the Common Council in appraisal, acquisition, transfer and sale of all real estate other than that which must by law be acquired by condemnation. The work of insuring an orderly annexation program is likewise under the direction of the Board in order that the expansion of the city may fit into the harmonious development of a general city plan.

Planning in Milwaukee became a conscious effort with the advent of 1917, when the Board created a city planning staff to work out in detail various problems presented to it for solution. Since then an appreciable amount of progress has been made in all phases of planning, even though the policy of the Board is to go slowly rather than unwisely rush into recommendations for capital expenditures. Each and every project is thoroughly studied, the commissioners keeping constantly in mind the city's financial ability to absorb it.

Civic Center

As early as 1909, the then existing Metropolitan Park Commission discussed the problem of a civic center for the grouping of public buildings, but it was not until 1920 that the site for this project was finally decided upon by a vote of the people.* Today the city and county jointly con-

* A description and plan of the Civic Center appears in the 1930 Municipal Index, page 165, in a study of "The Public Building Groups of 54 Cities."



LINCOLN MEMORIAL DRIVE

This extends along the lake shore for a distance of 2.8 miles. With the exception of approximately 4,600 feet, the city of Milwaukee controls the lake shore riparian rights from the south city limit to the north city limit, a distance of seven miles

BLUE MOUND ROAD

The county has widened this stretch of road to 120 feet and developed it as a super-highway from city limit to county limit at the west

KILBOURNE AVENUE

The view from Fifth Street towards the Civic Center area as seen above shows the $7,000,000 Court House, now under construction, in the middle background; the $2,500,000 Public Safety Building in the background at the right; and the Municipal Auditorium in the right foreground. The street as widened is 130 feet

trol about five-eighths of the property needed to eventually complete the plan for this improvement. A joint city and county Public Safety Building has already been erected and the Milwaukee County Court House, now in the course of construction, should be completed some time in 1931. Kilbourn Avenue, the main avenue of approach to the Civic Center, has been widened from 80 feet to 130 feet from Broadway to Sixth Street, a distance of one-half mile, and is to be eventually widened west to Ninth Street, upon which the main façade of the Court House fronts. This will open a magnificent east and west vista to and from the Court House.

Major Thoroughfares

Because of the decentralized character of Milwaukee's many substantial business districts, the central business area in the heart of the city has not as yet suffered from the traffic congestion obtaining in most other large cities. Unless, however, we can develop conveniences in the outlying districts which will promote a continuance of the decentralization of commercial interests, Milwaukee will eventually be confronted with this problem.

Altogether, 14 miles of streets have been widened, 13½ of which were in outlying districts. Kilbourn Avenue, widened for a distance of one-half mile, is the only major improvement undertaken so far in the downtown area.

The first step in a major thoroughfare system recently adopted by the Common Council contemplates widening Kilbourn Avenue for an additional three-quarters of a mile, providing, when completed, a broad east-and-west artery through the central business district. Sixth and Ninth Streets are two other widening improvements recommended that will, when completed, facilitate traffic movements in the congested area.

All of the condemnation widenings have been financed through bond issues, with an assessment of benefits levied against property benefited.

Ten miles of wider roadways have been secured through the setting back of curbs to permit four lanes of moving vehicles. Practically all of these were streets with street car lines. About six-tenths of the cost of setting back curbs is assessed against the abutting property owners.

The benefits of cooperation resulting from the complete harmony existing between the city and county planning agencies are exemplified in the dedication through platting of approximately fifty miles of widened highways in the city and county.

Zoning

In November, 1920, a comprehensive zoning ordinance drafted by Arthur C. Comey, city plan consultant, was adopted by the Common Council. Its administration has been marked with singular success due principally to the excellent judgment used by the board of appeals in deciding on exceptional cases, and through the perfect cooperation existing between the planning commission, building inspector, and board of appeals.

The stringent enforcement of the ordinance has met with the popular approval of the citizens and press and today is recognized as an essential medium through which the city can develop in an orderly and efficient manner.

Parkways

Three rivers, the Milwaukee, Menomonee, and Kinnikinic, have their outlet into Lake Michigan at Milwau-

KILBOURN AVENUE IMPROVEMENT
Another view towards the Civic Center before and after widening and the construction of the $600,000 bridge across the Milwaukee River

A TYPICAL NEIGHBORHOOD PLAYGROUND

kee, flowing through the city from the north, west and southwest. In order that the community may preserve these natural assets, particularly where they flow through residential districts, parkway plans have been prepared.

Of the 451 acres involved, 207 acres have already been acquired. The city parkway units are coordinated with the county system, which is 85 miles in extent.

No assessment of benefits for park or parkway acquisition has ever been levied.

Platting

While the Board of Public Land Commissioners has authority to prepare platting studies of the area within 3 miles of the city limits, the Common Council has jurisdiction over legal plats within 1½ miles only. All plats are referred to the Board for approval.

As an educational feature, the Board prepared a comprehensive platting guide in 1924, which has been extremely useful to owners, agents, realtors and engineers subdividing lands. As a result of this guide a greater consciousness of the value of parkways, larger lots and wider streets has grown up, rewarding both the subdivider and the community with a much better type of platting.

Playgrounds

In 1923 Milwaukee had but 16 acres of supervised playgrounds, exclusive of those in parks, and the lack of proper play space for children was keenly felt. After a comprehensive survey, bond issues totaling $2,075,600 were authorized and today the city has 95 acres developed for their purpose. Further studies are being made based on the needs for the next ten years.

Airports

Early this year the Common Council created an Airport Committee to study the feasibility of a lake front airport adjoining the heart of the city. While the Committee is not as yet prepared to make any recommendation, considerable progress has been made in the studies and a definite recommendation for a lake front airport will very probably be made in the near future.

PROGRESS IN THE MILWAUKEE LAKE FRONT IMPROVEMENT

Plans for the treatment of the waterfront have been the subject of much discussion and preliminary action over a long time. Not until recently, however, has work gone ahead on an official basis. The above aerial view of the lake front shows the Juneau Park improvement and the Memorial Bridge, with the Lincoln Memorial Drive. This Drive extends north along the lake shore for a distance of 2.8 miles to Lake Park.

It is a part of the present definite plan to extend the Lake Shore Drive southward from the Memorial Bridge to the city limits. When this has been done, Milwaukee expects to have one of the finest waterfront developments in the country. It is one which, with the proposed parkways, promises a system of pleasure drives which any city might anticipate with pride.

Pumping Water Without Watching It

By LEON SMALL

Superintendent, Engineering Division, Bureau of Mechanical-Electrical Service, Baltimore, Md.

EXTERIOR OF THE CATONVILLE AUTOMATIC PUMPING STATION OF THE BALTIMORE WATER-SUPPLY SYSTEM

THE economies to be gained by an automatic system of operation for water-pumping stations which permits the absence of an operating personnel are quite marked. The present discussion is limited to electrically operated automatic stations without prime-mover emergency stand-by units, discharging into a standpipe or similar means of reserve, as it is considered that the application of such stations is limited to this class of service.

Housing

The housing of the equipment for an automatic station is the most important consideration and the two elements that should be carefully considered in this connection are protection against freezing and provision for proper drainage. Any freezing protection dependent upon artificial heat such as electric heating units is not thoroughly dependable. The most effective, economical and certain way of protecting against freezing is to place the main portion of the structure below ground with sufficient earth covering above to insure that freezing temperatures will never exist in the pump room. It has been found that with an 18-inch covering of earth over the top slab of the buried portion of the structure, the lowest temperature reached in a pump room has been 35 degrees Fahrenheit, this being at a time when the outside temperature during the night fell to 5 below zero and the operation of the pumping machinery with its consequent generation of heat had been suspended for a period of more than four hours. To gain access to the pump room these stations are built with a structure outside the wall of the main portion to form a stairwell, and in this construction is included an arrangement of two doors, one at a middle landing on the steps and one at the bottom of the steps where it enters the pump room. These form an air lock to arrest the transfer of heat by way of the stairwell.

The location of the structure underground may produce difficulties in some localities on account of drainage, but in Baltimore it has been possible in every case to obtain a gravity drainage line. Where conditions would not permit gravity drainage and sump pumpage would have to be resorted to, a dual arrangement of both electrically operated and water-ejector means of sump unwatering should be adopted, as an accumulation of water which might follow the failure of an unwatering system would be highly undesirable. In addition to the necessity for getting rid of waste water which accumulates in the station sump incident to operation, it is also necessary to keep surface drainage from penetrating the structure and creating a damp condition. To satisfy this requirement the entire structure from the ground line to the bottom of the wall footing should be protected by a membrane waterproofing with an outside tile drain line carried around the footing and led into the sump.

The Question of Reliability

There may be an impression that the absence of attendants in an automatic station militates against the reliability of the plant operation, but the writer submits that this consideration, while of prime importance generally in water-works service, is not a serious factor, and with the increased reliability that has developed in the past few years in power supply control apparatus and other elements upon which the continuous service of a pumping-station is dependent, the automatic station stands alone in its field. In line with this thought, it may be considered axiomatic that with any electrically operated machinery whatever can be done by manual control can be done better by automatic electric control, and an experience of a number of years in the design, construction and operation of electrically operated pumping-stations has convinced the writer of the truth of this assertion.

Equipment

The equipment for the station should be divided into two or more units and, if two units are used, these should be in duplicate and interchangeable to permit a transfer of a portion of one unit to the other in case it is necessary. The electric service for the station should be brought in underground from the pole line and this arrangement, while somewhat more costly initially, contributes considerably to the neatness of appearance of the surroundings and allows complete freedom of choice as to the direction in which the service is brought. In addition, the underground arrangement gives a very practical benefit of minimizing the danger of lightning dis-

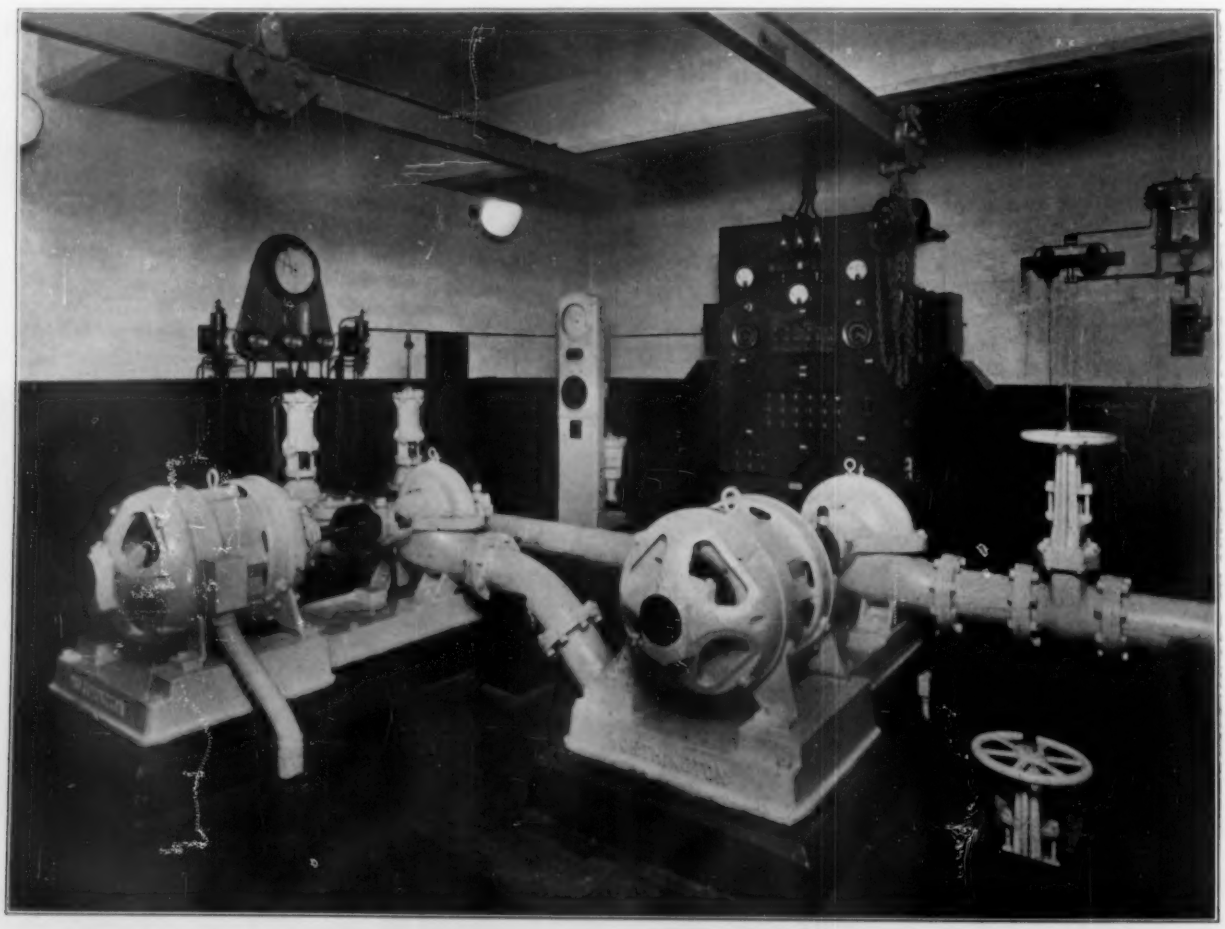
charges on the power lines and even with a direct stroke immediately at the point where the service is taken from the pole line, the effect of the lightning discharge, if it followed the station service, would be dissipated in the ground before it would expend its force on the station equipment.

From the service entrance the circuit should be led through a fused disconnecting switch to the control panel with fuses of such capacity as to be the strongest link in the chain of over-current protection devices, but not so strong as to fail only after permanent damage has been suffered by the apparatus in the event of an over-current condition. When the standard potential is 440 volts the circuit may be handled through an air type breaker mounted on the station control board. This breaker should be provided with magnetic overload protection with means for ready calibration, but a no-voltage release device should not be included on the breaker unless the latter is of the automatic reclosing type, as a momentary voltage dip may cause the no-voltage release type to open the breaker and the station would be inoperative until attention was received. After leaving the main breaker the circuit should be carried through the desired metering instrument elements and led to a bus construction from which the two or more motors in the station are fed. Each circuit feeding the motor should take off through a disconnecting switch, so that the opening of this will kill the corresponding motor and starter and thus permit repairs to be carried on without interfering with the operation of the remainder of the station equipment.

The type of motor starters that may be used depends upon the kind of motor that is selected and the starting current limitations of the power company. A variety of starters for performing the required service are available and the proper choice depends upon the local conditions to be met. Whatever starter is selected, it should be provided with thermal overload protection in two phases and so constructed as to be able to withstand successfully a number of starts in close succession. Such starters with automatic operation, being dependent upon magnetically operated contacts, inherently include no-voltage protection and for this reason the omission of a no-voltage release on the main panel breaker, referred to above, is of minor importance.

Types of Motors

Either the squirrel-cage or the wound-rotor induction motor are available for service such as is being considered. Synchronous motors, of course, may also be chosen, but, unless there are strong inducements offered for their use by the power company wishing to gain the benefits of the power-factor correction feature of the synchronous motor, the comparative complications of this type do not commend them for the presently considered form of application. The squirrel-cage induction motor presents advantages over the other type, among which may be noted lower first cost, simplicity and ruggedness, high efficiency, and the ability to operate at higher speeds with safety.



INTERIOR OF THE CATONVILLE STATION

Their application generally, however, is handicapped by the high starting-current inrush that is a squirrel-cage characteristic, although recent designs of deep-bar and double-cage windings on squirrel-cage rotors have improved these motors to an extent that has considerably enlarged the field of squirrel-cage application, which has been limited in the past by the starting characteristics.

The wound-rotor induction motor offers a ready solution in the event that the squirrel-cage application cannot be worked out and the installation of this type will usually simplify the starting equipment to an extent that the wound-rotor motor is the preferable one from an over-all viewpoint. It should be borne in mind, however, that upon the motor depends to a large extent the successful operation of the station and the primarily apparent advantages which may appear from the installation of a wound-rotor drive should not be allowed to overbalance the lasting benefit of maximum dependability that is an outstanding quality of the squirrel-cage construction.

One of the most important features of an automatic station is the control system by which the operation of the equipment is governed. The systems by which the head of water in the reservoir or standpipe governs the pumping equipment fall into three general classes: (1) float switch in the tank with control wires led back to the station; (2) a separate pressure line from the tank to the station; and (3) an altitude valve on the tank arranged to close when the tank is full, and in this manner build up pressure on the entire distribution system above the normal operating point, thus effecting the function desired.

Of these three general schemes the float switch is the least desirable in water-works practice, due to the complications that are brought about by freezing and the necessity for maintaining the control wires from the tank to the station. A separate pressure line between the tank and the station, although overcoming the objection, on the grounds of freezing, that handicaps the float switch method, entails considerable installation expense and the pressure line is a weakness that must be constantly protected to insure the continuity of station operation. In addition to these disadvantages, the direct pressure system may in some installations give an operating range for control that is a very small percentage of the total head pumped against and, as pressure-actuated contact-making devices are none too sensitive at best, any system in which the total range of pressures between the start and stop positions is a small proportion of the total pressure that must be borne by the contact gage, should be avoided. This system also presents the disadvantage of making and breaking contact very slowly, with the detrimental result that always follows such procedure.

The third method outlined offers the cheapest and most satisfactory and reliable method of control operation that has been developed. This system consists of an altitude valve placed in the discharge line where it enters the standpipe or reservoir, arranged to shut when the tank reaches the desired level and open again after the level has fallen four or more feet. A by-pass with a check valve is inserted around the altitude valve to permit the tank to discharge into the system after the pumps are shut down and before the altitude valve reopens. This method of control offers the advantage of having all the elements gathered at one point in an underground frost-proof vault, and under normal conditions nothing short of a break in the distribution system can disarrange its operation. Its use also simplifies the adjustment of the control devices in the station as the system pressure, when the standpipe is full and the altitude valves closes, builds up abruptly and definitely, giving a positive cut-off point that is not dependent upon close or maintained adjustment.

A point that is often overlooked in the design of station control apparatus is the necessity of a pressure-wave damping tank in the lines leading to the contact gages. Without such devices the contact gages will follow the amplitude of the pressure surges that occur subsequent to the shutting-down of the pump and not infrequently the discharge-main pressure will dip sufficiently low immediately following a pump shutdown to cause the equipment to start again. This, of course, results in the immediate building-up of a pressure head to the shut-off point and the unit again shuts down only to be followed by another cycle of starting and stopping.

The choice of pumps for an automatic station depends upon the conditions to be met. The centrifugal pump, of course, is almost universally used, but the displacement type of any kind is as adaptable to automatic operation as is the centrifugal. In a centrifugal-pump installation, however, it should be borne in mind where the system is to be controlled by the altitude-valve method, that the discharge-head conditions of the distribution system must be carefully considered and the head-discharge characteristics of the pump should be such that sufficient head is developed to give an ample operating range when the altitude valve closes.

Priming and Valves

With an underground station such as has been indicated as desirable, there is usually no difficulty about priming the pumps if centrifugals are selected, but if priming is a consideration that must be met, automatic priming has been successfully developed and used over a sufficient period of time to demonstrate its entire dependability. If priming must be a part of the station operation, this feature requires merely another element that must be provided in the starting equipment ahead of the main pumps.

Station valves would seem to be a form of equipment so old and well developed as to be beyond the scope of discussion, but it is surprising what an amount of trouble can be found unless proper attention is paid to these details. Check valves in the discharge line are particular offenders and, if they are of the usual swinging-disc type, and put in the line without any thought of subsequent maintenance, the disc may soon wear and drop from its hinge pin, particularly if the demands on the distribution system are subject to severe fluctuation.

The pump discharge valves in the usual layout of automatic stations are generally open, with the water held by a check valve. Such an arrangement permits the pump to impose a load on its motor as soon as the speed reaches a point where the head developed is sufficient to lift the check valve against the distribution-system pressure. Often this condition is highly undesirable as it means that the motor is being placed under load before it is in the full running position. Such a station design and operation presents an unnecessary handicap upon the use of a squirrel-cage motor with its less favorable starting qualities and the cause for such conditions may be readily avoided by the proper attention to design.

ACKNOWLEDGMENT.—From a paper read before the Fourth Annual Conference of the Maryland-Delaware Water and Sewerage Association, Hagerstown, Md.

The Operation of Sewage Disposal Plants of the Tank and Filter Type

By V. W. WHITFIELD
E. T. Archer & Company, Consulting Engineers, Kansas City, Missouri

IT is generally conceded that sewage treatment plants in the smaller towns, particularly those of Imhoff tank and filter types, are among the most inefficiently operated of the municipal utilities. As they are in isolated and often inaccessible places, their supervision and operation is left to the action of the elements and the force of gravity.

Numerous reasons may be cited for this apparent neglect. Complaints are heard of scarcity of funds, overworked employees, and lack of interest on the part of the city officials. Experienced labor is seldom available. Attendance at a short-term school sponsored by the State Health Department offers the only opportunity for operators to become familiar with the biological processes and mechanical features underlying the theory of sewage treatment.

If a well-planned routine is adopted and adhered to and if the more simple analytical tests are made, the operation of one of these plants is not particularly tedious nor is a great deal of time required. A period of an hour a day, *every day*, efficiently expended, would not only result in considerable betterment in the quality of the effluent but probably reduce the total cost of operation over a period of years.

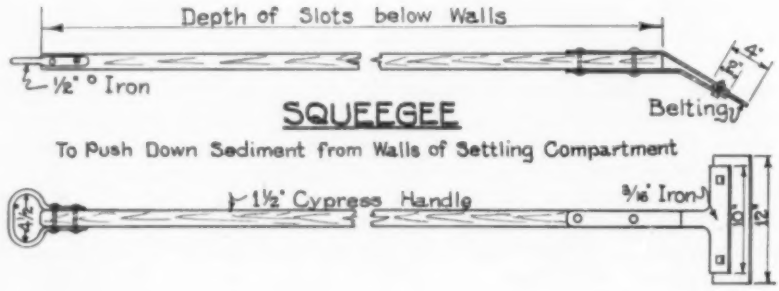
Rough Screens

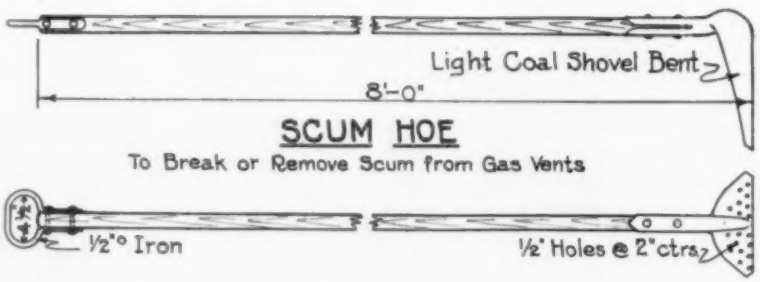
Screens should be raked as often as necessary and never less frequently than once a day. Occasionally two rakings a day will be required. Screenings should be left at least 24 hours to allow surplus liquid to drain off, and then disposed of by burial or incineration before their decomposition causes a nuisance.

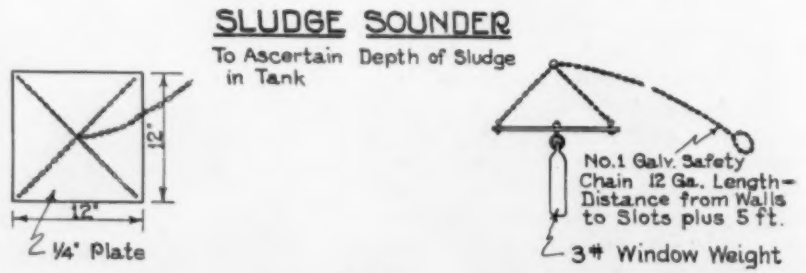
Care of the Imhoff Tank

Imhoff tanks serve a two-fold purpose. In the upper compartment through which the sewage flows, such solids as may be heavier than the sewage settle and become sludge. In the lower compartment this sludge undergoes a digestive or ripening period, liquefies, emits gases and eventually becomes of such a nature that it may be discharged on the sludge bed for drying with a minimum of nuisance from gases given off in drying.

The principal difficulty encountered in the operation of the Imhoff tank is scum formation in the gas vent. This scum consists of sludge, filled with gases of decomposi-

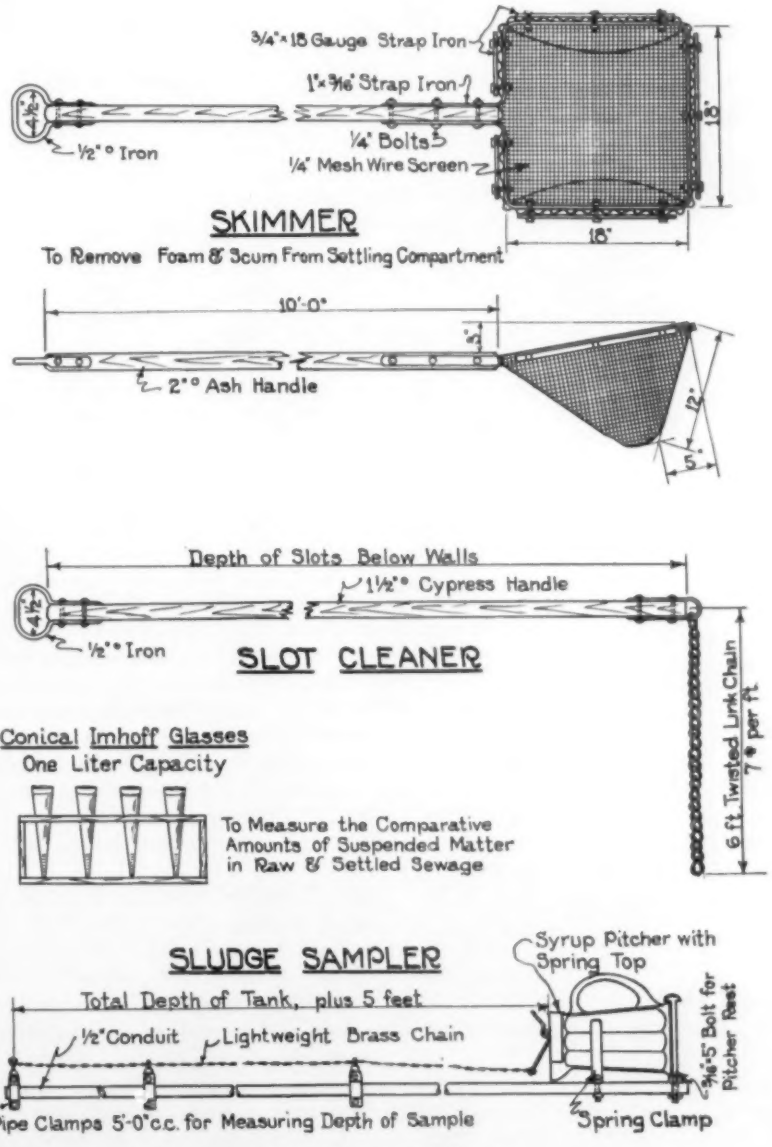





SLUDGE SOUNDER
To Ascertain Depth of Sludge in Tank
12"
12"
¼" Plate
No.1 Galv. Safety Chain 12 Ga. Length – Distance from Walls to Slots plus 5 ft.
3# Window Weight

Miscellaneous Implements for the
Designs by C. H. Currie

tion. When it is not broken up, so that the gas may escape, it may possibly continue to rise and overflow into the sedimentation chamber. Therefore, all scum forming on the gas vent should be broken up at least daily, and, should it become necessary, twice a day. If water pressure is available, sluicing with a hose usually allows the gas to escape from the scum, after which it will soon sink. Permanent piping arranged so that a continuous trickle falls on the scum and foam is also very effective. Excessive scum formation is often an indication of an acid condition in the sludge compartment. When a pH kit is available, a sample may be tested, or, in the absence of a pH kit, litmus paper may be used to give a rough approximation. Good sludge has a pH of about 7.6. Should an acid condition be indicated, lime may be added, which will often assist in correcting the condition. The lime is usually best added by placing it on the gas vent or introducing it through a tube or a piece of pipe directly into the sludge compartment. If dissolved in the raw sewage, much of its effect is lost by the solution being carried directly through the tank. When so much scum forms on the gas vent that there is a possibility of the surplus being blown over into the settling compartment, it should be removed and placed on the sludge bed to dry. Scum forming on the surface of the settling compartment or blown there from the gas vents should be removed daily and placed either in the gas vent or on the sludge bed.



Operation of Sewage Treatment Plants

and B. E. Guymon

Precautions Worth Remembering

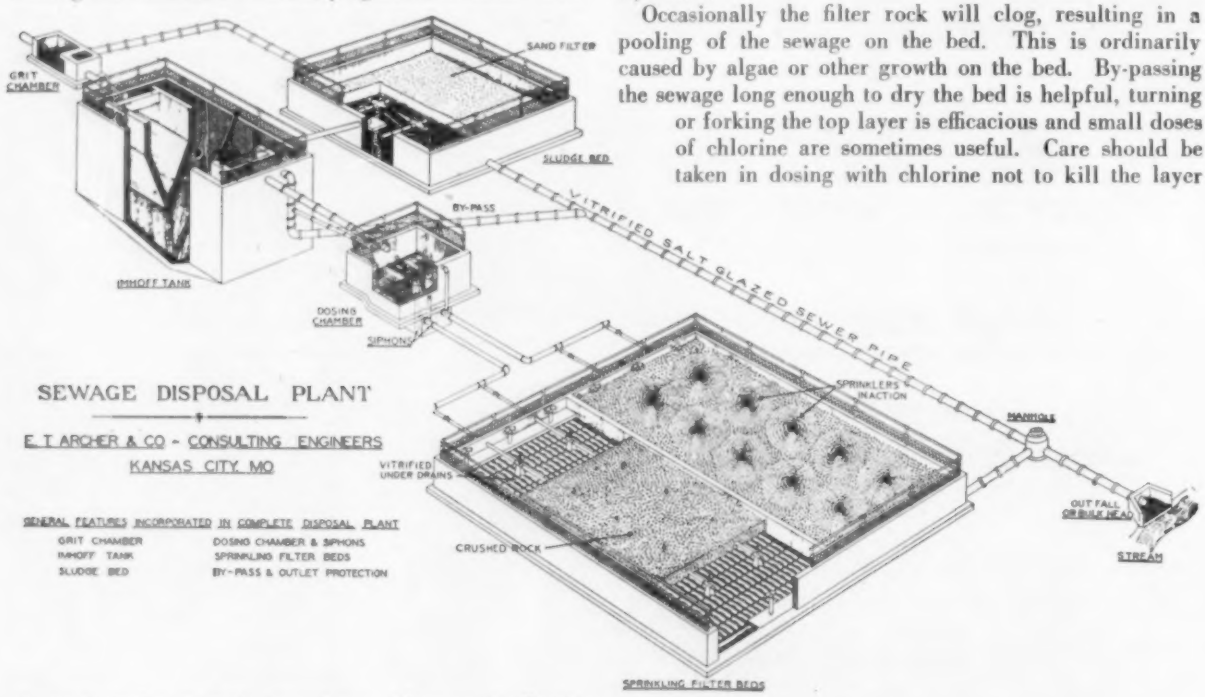
Weekly tests should be made by means of Imhoff cones to determine the efficiency of the settling compartment of the tank. Weekly, too, the flushing ring valve, if the tank is so equipped, should be opened for a few moments, and likewise the valve furnishing water pressure to the interior of the sludge pipe. Not only does this prevent the liquid sludge from caking around the sludge shoe and causing difficulty when efforts are made to draw it off, but at the same time the sludge is agitated and the alkaline sludge in the bottom of the tank becomes mixed with the acid sludge which has recently settled. A careful examination should also be made of the liquid in the settling compartment, for the escape of gas bubbles. These indicate the adherence of putrefying matter either to the sides of the sloping walls or the slots of this chamber. The remedy is to squeegee the sides of the sloping walls, pushing all matter down towards the slot and drawing a heavy log chain along the edges of the slot, thus cleansing it of all sediment. In cases of extremely heavy scum formation, there is a possibility of gas being compressed by means of the scum until it is forced out through the inlet slot. The only remedy for this condition is the removal of the scum from the gas vent.

Drawing the Sludge

About every two weeks the direction of flow of the sewage should be reversed. The heavier matter in the sewage has a tendency to settle as soon as it enters the tank. The lighter and more colloidal matter is held until toward the end of the flow. As a result, the flow is reversed, the heavier sludge formation will be near the entrance of the tank and when sludge is drawn the larger percentage will consist of the lighter sludge. Every few weeks, samples should be taken show-

ing the height of the sludge, and previous to the time it fills to within two feet of the entrance slot, sludge should be drawn.

No definite rule can be given as to how often this should be. It is much better to draw small amounts often than large amounts occasionally, as the retention of the remainder in an alkaline condition is assured. Care should be taken when drawing the sludge that it is not drawn too rapidly. Not only does it splash on the sludge bed, disarranging the sand, but there is a tendency for the sludge to be drawn from an inverted cone within the tank, thus leaving the remainder to solidify against the walls. Well-digested sludge is dark in color and has an inoffensive odor, while acid sludge is grayish and the odor is foul. As a general rule, about a six-month digestion period is required, which becomes longer with low temperatures.



The Sludge Beds

Sludge beds require little maintenance. Care should be taken to drain all sludge from sludge pipes in cold weather so freezing will not injure the pipes and valves. Sludge may usually be spaded from the beds within 10 days or two weeks after being drawn. Small amounts of sand are removed with the sludge, necessitating the eventual renewal of the bed.

The Dosing Tank

Siphons have been developed to a point where the operation of dosing tanks is very reliable. Apparently the only catastrophe to which they are heir is an occasional air leak in the small piping, or loss of prime. The remedy for either condition is apparent. It is wise to inspect the chamber frequently in both full and empty conditions, remove all floating débris and occasionally sluice down any sediment toward the bottom, where it will be drawn off with the sewage.

The Trickling Filters

The operation of trickling filters depends not so much on the filtration secured as on the oxidation of the sewage and the absorption of solids and colloidal matter by the jelly-like slime that quickly forms on and covers the filter media.

Daily inspections are an essential routine in the operation of trickling filters. There is an apparent affinity between small boys, junk dealers, and sprinkler nozzles. A daily inspection should disclose any of these nozzles that are missing or clogged, and immediate steps should be taken for replacement or cleansing as may be necessary. The best time to make this inspection is while the filter nozzles are discharging, when any difference is readily noted.

Occasionally the filter rock will clog, resulting in a pooling of the sewage on the bed. This is ordinarily caused by algae or other growth on the bed. By-passing the sewage long enough to dry the bed is helpful, turning or forking the top layer is efficacious and small doses of chlorine are sometimes useful. Care should be taken in dosing with chlorine not to kill the layer of slime existing in the bed.

The weekly inspection should include an examination of the discharge of the underdrains and should any apparently be filled with slime, they should be flushed or rodded.

During warm months, the operator may experience considerable discomfort from the filter moths. They apparently do not interfere with the operation of the filter and unless blown by a strong wind seldom are found over 150 feet away, so they are usually left to their own devices.

From the nature of the treatment, it is evident that odors will arise from trickling filters. The only way in which these odors may be controlled is by chlorination of the sewage. This is expensive and seldom justifiable. Careful attention to the operating features of the Imhoff tank will usually assist in lessening the odor nuisance.

From time to time, the slime previously referred to is unloaded and carried out through the effluent. Resettling tanks are therefore needed to settle out this slime. Practically the only attention required in connection with their use is a periodical removal of sludge. This may be placed on the sludge bed to dry or may be pumped to the sludge digestion chamber of the Imhoff tank for further digestion.

The Sand Filters

The distributing system on a sand filter should be inspected at every opportunity. A supply of replacement

material should be available at all times and any of the lines showing breakage or displacement should be immediately repaired, since otherwise portions of the bed would be overloaded and eventually clogged. This daily inspection should also disclose any pooling of the effluent. This may be caused by the clogging of the bed or a low place in the sand. If the sand is clogged, the top portion should be removed as deeply as necessary, usually to a depth of two inches, and new material substituted. If caused by a low place in the filter bed, the sand should be brought to a level plane either by the reduction of an adjacent ridge or by the addition of new material.

During severe winter weather, there is a probability of the sewage freezing on the sand before passing through. If the sand bed is ridged and furrowed with a garden hoe or rake, this condition may be overcome but the location of these furrows should be changed often to prevent clogging of the bed along their lines. The effluent from the sand bed, when furrowed, is seldom as stable as when not furrowed, but since it is during cold weather there is little danger of an odor nuisance.

On the western plains, where high winds are frequent, sand beds are subject to clogging on account of fine material being blown in. The only remedy for this difficulty is the removal of the top layer of sand at intervals and replacement with new material.

General Operating Features

Since sewage, with its unusual avidity for oxygen, is more corrosive than water, routine inspection should be made of all valves, exposed piping and other metallic equipment around the plant. All working parts of valves should be kept well greased and oiled. Exposed woodwork should be given an occasional coat of paint but under no circumstances should a lead paint be used.

Weeds should be kept cut in and around the site of the plant. Where rain washes down embankments, they should be regraded and seeded with blue grass.

It might be said, incidentally, that any expenditure in grading and landscaping the plant will show good returns on the investment.

Routine tests of the performance of the plant should be made often and records kept as to results secured, since detailed records may be of assistance in controversies with owners of property below the plant.

Suggested Schedule of Routine Operations

Daily

Rough Screens.—Rake screen and burn screenings from previous day.

Imhoff Tank.—Remove scum from settling compartment. Break up scum on gas vents.

Dosing Chamber.—Remove floating débris from tank.

Sprinkling Filters.—Inspect filter nozzles.

Sand Filters.—Inspect distribution system.

Weekly

Perform Analytical Tests.—Test raw sewage, Imhoff-tank effluent and final settling tank or sand-filter effluent for 2-hour settleable solids. Secure sample and commence methylene blue test for relative stability.

Imhoff Tank.—Inspect settling compartment for gas bubbles and if necessary squeegee sides and draw chain through slots. Open flush ring valves. Remove scum from gas vents if necessary.

Sprinkling Filter.—Inspect surface of bed for pooling. Check operation of underdrains.

Sand Filters.—Inspect surface of bed for pooling.

Every Two Weeks

General Inspection.—Inspect, clean and lubricate all valves. Clean up around plant. Examine embankments for washing. Make general inspection of plant.

Imhoff Tank.—Reverse flow of sewage. Test sludge depth and draw off if necessary.

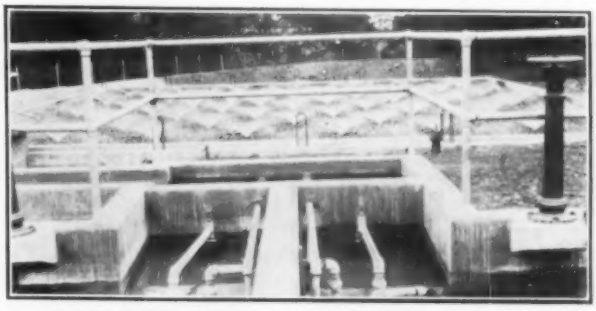
Sludge Beds.—Remove dried sludge from bed filled previously.

Methylene Blue Test—For Stability of Effluent

Purpose.—To determine whether effluent from final treatment will decompose and cause odor nuisance.

Apparatus.—One 250-cc. glass-stoppered bottle; ½-pint of sewage effluent; standard methylene blue solution; measuring pipette.

Method.—Collect sewerage sample in glass bottle, so bottle overruns, add exactly 0.60-cc. of standard solution* and hold at either 65° to 69° F. or 95° to 100° F., observing twice a day until decolorized; express results in "relative stability" from following table:



TWIN DOSING TANKS AND FILTER AT OLATHE, KANS.

Time at 65°-69° F.	Time at 95°-100° F.	Relative Stability
.5		11
1.0	0.5	21
1.5		30
2.0	1.0	37
2.5		44
3.0	1.5	50
4.0	2.0	60
5.0	2.5	68
6.0	3.0	75
7.0	3.5	80
8.0	4.0	84
9.0	4.5	87
10.0	5.0	90
11.0	5.5	92
12.0	6.0	94

Test for Alkalinity of Sludge

Purpose.—To determine relative alkalinity or acidity of sludge previous to removal from tank.

Apparatus.—Sample of sludge; distilled water; pH set.

Method.—Usually described in detail in directions accompanying pH set and therefore not given here.

Test for Settleable Solids

Purpose.—To determine the efficiency of the plant in removing sediment from the sewage.

Apparatsu.—3 Imhoff cones; ½-gallon each of raw

*Standard solution is prepared by dissolving ½-gram of chemical in water and diluting to 1,000 c.c. or one liter.

sewage, Imhoff tank effluent, and sand filter or final settling-tank effluent.

Method.—Fill Imhoff cones with sewage, which should be kept agitated till placed in cones, and record quantity of sediment in each after two hours settling.

Suggested Laboratory Equipment

STABILITY TEST

Catalog No.		
2221	12	250-cc. glass-stoppered bottles
8160	2	Pipettes—1-cc. @ 1/10-cc.
2220	1	1,000-cc. solution bottle
4408	2	250-cc. graduate cylinders
5570	2	5-inch funnels
	10	grams methylene blue

SETTLEABLE SOLIDS

4040	4	Imhoff cones and stands
9825	2	washwater bottles

SLUDGE TESTING

2321	20	50-cc. sample bottles
4056	100	1¼-inch corks
		Sludge-testing sets

MISCELLANEOUS

5 gallons distilled water

Laboratory items showing catalog numbers may be purchased from A. H. Thomas, Philadelphia, Pa. Sludge-testing set may be purchased from La Motte Chemical Works, Baltimore, Md. Distilled water to be procured locally. Total cost about $75.

The Hazard of the Wintry Crosswalk

By **HARRY E. WEINBERG**
First Assistant City Attorney, Duluth, Minn.

GREATLY increased appropriations for snow disposal, and much vexatious litigation, face Minnesota municipalities in the future as the result of a decision handed down December 27, 1929, by the Supreme Court of the state of Minnesota in the case of *Barrett v. City of Virginia*, 228 N. W., 350, holding that a city may not be absolved from liability for injuries sustained by a pedestrian resulting from a fall on artificially accumulated ridges and ruts caused by wheeled traffic, merely because the accident occurred on a crosswalk forming that part of the pavement which lies between the lines of the sidewalk if extended across the pavement.

In determining the duty and measure of care required to be exercised by cities with reference to permitting artificial accumulation of snow and ice to form on crossings or crosswalks in public streets to such extent and for such lengths of time as to result in the formation of dangerous slopes, ridges and irregular ruts, the Barrett case, in part, holds that:

> "The duty to exercise due care applies, as matter of law, as much to crosswalks as to sidewalks. Considerations of fact may frequently result in denying negligence on a crossing where under the same circumstances it might be affirmed had the accident occurred on a sidewalk. But such a difference in results would not be due to any difference in the law governing the two cases, for there is none. The degree of care required is commensurate with the circumstances. The law requiring it, in the maintenance of streets and sidewalks, does not change from case to case, but the circumstances by which it is measured are never quite the same."

Wheeled traffic, wind velocity, alternating freezing and thawing temperatures during the six-month period from November to April, will cause the many miles of crosswalks in cities where snow frequently falls during these months, to experience changes in the surface condition of these crosswalks daily and often from hour to hour in a single day. "Care commensurate with the circumstances" carries with it the consideration of another rule of law, that the greater the danger to be apprehended, the greater the degree of care to be exercised. A municipality in performance of its duty to keep and maintain its highways in a reasonably safe condition for ordinary travel is bound to anticipate all consequences resulting from the combination of ordinary circumstances to the extent that ordinary human foresight is capable for forecasting such results. An application of these rules to municipal duty relating to snow disposal on crosswalks in the latitude of northern Minnesota, will lead to the consideration of some interesting, if not startling, figures. For assistance in compiling and making these figures intelligible to the layman's grasp, I acknowledge full measure of appreciation to John Wilson, City Engineer of the city of Duluth, and H. W. Richardson, U. S. Meteorologist for the Duluth District.

Heavy Snowfall Thaws at Low Temperatures

Every winter season Duluth may expect to have a snowfall of 56 inches. It has the right to anticipate this amount of snowfall, because Mr. Richardson says his records show an average of 56 inches ranging over a period of nearly 40 years. And if you call Mr. Richardson as your own witness or cross-examine him as the opposing party's witness, he will tell you that, although the mercury may be under zero, it is a matter of common occurrence for the sun to cause snow to thaw where it lies favorably exposed to the sun. Mr. Richardson calls this thawing process "solarization." Municipal officers charged with the duty of snow disposal call solarization something else when it combines with wheeled traffic to put ridges and ruts on crosswalks. And juries sometimes translate this solarization process into something still different—a verdict for cash damages for the plaintiff.

Effect of the Wind

Wind velocity is a tremendous factor in this part of the country in causing drifting of snow, the formation of ridged accumulations of snow and ice on crosswalks, and atttendant increase in costs of snow disposal. For seventeen years the average wind velocity in this part of the country during the six months beginning with November and ending in April has averaged 10,000 miles a month. The prevailing wind is from the northwest during this

season of the year. The average temperature is below the freezing point during the greater portion of this period. The fall of snow is dry. All these factors combine to create an ideal condition for snowdrifting. March, with its high and frequent winds averaging a total of 10,700 wind miles, and with its sudden frequently reoccurring changes from freezing to thawing temperature, is a bad month on crosswalks.

When winter comes, the snow-disposal fund, which looked so large in budget-making time, begins to shrink into insignificance. And no wonder at that. Just take a look at these figures which have been worked out by Mr. Wilson:

	6 Inches Snow Cubic Yards	Number Men to Handle in 10 Hours	Number of Trucks	Cost to Remove	Cost to Remove Normal 54 Inches
Crosswalks—90 miles, 6 feet wide.....	52,800	1,030	587	$21,807.00	$196,263.00
Sidewalks—385 miles, 5 feet wide.....	188,000	3,660	2,090	77,644.00	698,796.00
Paved streets 140 miles, 30 feet wide.....	411,000	7,990	4,560	169,743.00	1,527,687.00
Grades but not paved, 260 miles, 20 feet wide	508,000	9,875	5,640	209,804.00	1,888,236.00
	1,159,800	22,555	12,877	$478,998.00	$4,310.982.00

Because of drifting this might have to be handled two or more times.

Normal weight 168 lbs. per cubic yard
Normal weight 420 lbs. per cubic yard after plowing

Snow removal budget, 1928-1929.....	$57,800 00
Snow removal budget, 1929-1930.....	56,780.00
Spent in 1928-1929, in sanding walks and snow removal.....	87,048.43

The Crosswalk Problem

The foregoing figures and data are self-explanatory and make it possible at a glance to grasp the enormity of the problem confronting municipalities if they are to perform their duty with reference to snow disposal as seems to be indicated by the Barrett case; but the problem becomes the more perplexing with reference to safety of condition of crosswalks for all public purposes in the degree to which the municipality attempts to rid crosswalks of ridges and ruts caused by wheeled traffic in the snow which from time to time accumulates on the crosswalks.

The complete removal of snow from streets and walks in the average municipality would not only far exceed the available revenues of the city, but would actually produce a more dangerous condition, with attendant liability, than ever results under present methods of dealing with the problem.

AT THIS INTERSECTION A BUS CARRYING 18 SCHOOL TEACHERS TIPPED OVER WHEN IT STRUCK RUTS AND RIDGES IN THE ICE AT THE SIDE OF THE ROAD IN AVOIDING A COLLISION WITH AN APPROACHING AUTOMOBILE. FORTUNATELY, NO SERIOUS INJURIES RESULTED

A FAIRLY STEEP GRADE ON SECOND AVENUE EAST, BETWEEN FOURTH AND FIFTH STREETS, DULUTH, MINN., WHERE THE CROSSING BECOMES VERY DANGEROUS IN WINTER

Take a crosswalk as an illustrative situation. Motor-driven snow-plows push the snow to either side of the roadway. The plows are set to remove snow to a level of about two inches above the roadway, leaving a layer of that thickness of hard, packed snow on the roadway. Of course, wheeled traffic, drifting caused by wind, alternating freezing and thawing temperature, will cause the formation of rough, ridged and sloping elevations, depressions and ruts in the snow thus left on the crosswalk. If all the snow was hand-removed down to the roadbed in the intersections of a street, it would leave the crosswalks bare—until the next thaw or wind came along, but it would leave a depression or trench in the intersection which frequently recurring falls of snow, thaws, winds and wheeled traffic would turn into a catch-all for slush and ice; all productive of a highly dangerous condition, particularly in cities built on a hillside or having steep hills in their limits. The snow which has been pushed to the side of the roadway would greatly add to the danger. The removal of all snow from all public roadways and walks would still further add to the danger and result in requiring such sums of money to carry out the project that the inhabitants would be forced to vacate the city in order to escape a tax amounting to complete confiscation of taxable property. Of course, there is not yet any rule of law which demands performance of duties which are impracticable or financially ruinous in their results.

One of the chief obstacles in keeping crosswalks free from ridges and ruts is that a crosswalk in winter just will not stay "put"; as wheeled traffic carries off the gravel, sand, ashes or salt sprinkled on it almost as fast as put down, at the same time wearing ruts in the packed snow, and the ruts in turn get larger or smaller, rougher or smoother and more or less elevated or depressed as the whim of the weather wills it. A slicing machine in constant use might do the trick. This certainly would be an exercise of care commensurate with the circumstances. In effect, such care would amount to insurance. But until courts of last resort declare the rule of insurance against the wintry crosswalks and in favor of the hapless pedestrian, municipalities which lie in the snow belt will just have to worry along as they have in the past—making a pretty fine job of it, too, when all is said and done and fairly considered. The case of *Hapless Pedestrian v. Wintry Crosswalk* will be awaited each winter season with anticipation and interest.

Activated Sludge Plant Runs Itself at Night

By CLYDE POTTS, M. Am. Soc. C. E.
Consulting Engineer, New York

THE BLOWER HOUSE, WITH THE SEWAGE EFFLUENT IN THE FOREGROUND

THE village of Mineola is located about half-way between the north and south shores of Long Island, N. Y., and about twenty miles east of New York City. The village is generally residential and has shown a steady growth. The population was 3,016 in 1920, and 5,240 in 1925, and the 1930 census shows a present population of 8,139. The village is extremely flat, with only about 15 feet difference in elevation between high and low points. The soil is generally sand and gravel, with clay covering some sections.

This soil condition delayed the installation of sewers longer than would be the case in other localities having less pervious ground. This is generally true throughout Long Island, and cesspools are tolerated and can be used until the growth of the community and the resulting congestion makes the installation of sewers imperative. An unusual condition in Mineola was the almost complete absence of ground water at the depth of sewer trenches. There is no stream or watercourse within or near the village. Storm water seeps into the ground or flows into depressions or sink-holes with no outlets, which dry up after the rain.

Initial Steps in 1928

After a number of public meetings, at which the necessity of sewerage was presented to the taxpayers by the village officials, aided by the local representative of the State Department of Health, the village voted for sewers. Bids for the sewers and treatment plant were received on July 20, 1928, and the contract was awarded to Angelo Paino, the low bidder. Construction on sewers started in August, 1928, and work on the plant commenced in March, 1929. The work was completed in October, 1929, and the plant started in November, 1929. The sewer system includes 24.7 miles of 8-inch to 24-inch vitrified tile pipe. The flow is collected at a pumping-station and forced to the treatment plant. Three vertical sewage pumps, located in a dry well with motors on the main floor, are provided. The pumps are automatically controlled by floats, so arranged that if one pump cannot handle the flow, another one will start automatically. A gasoline-driven generator in the pumping-station furnishes an auxiliary source of power.

THE FINAL SETTLING TANKS, SHOWING THE SLUDGE SCRAPER DRIVE AND A PORTION OF THE V-NOTCH WEIR

Activated Sludge Process with Novel Disposition of Effluent

The activated sludge process seemed admirably adapted to meet the local conditions. With no stream at hand, it was necessary to use percolation beds to dispose of the effluent. A highly purified effluent reduced the area required for this purpose. There was only one site in the village available for the plant, and as in this locality houses were being constructed, odor prevention was a controlling factor in selecting the type of plant.

The plant was designed to treat a flow of 1,000,000 gallons per day, or a population of 10,000 people. Provision was made in the design for doubling the capacity when required.

The force main from the pumping-station delivers the sewage to the plant. A venturi meter at the treatment plant on the force main is connected to a recording, indicating and integrating register in the blower house. The sewage first passes through preliminary settling tanks in three units, each 17 feet 6 inches square and 8 feet deep. Motor-driven spiral sludge scrapers are used to draw the sludge to the outlets in the center of each tank. The tanks are cleaned when required, to prevent septic action, and sludge is pumped or discharged by gravity to the digestion tanks, which are adjacent to the preliminary tanks.

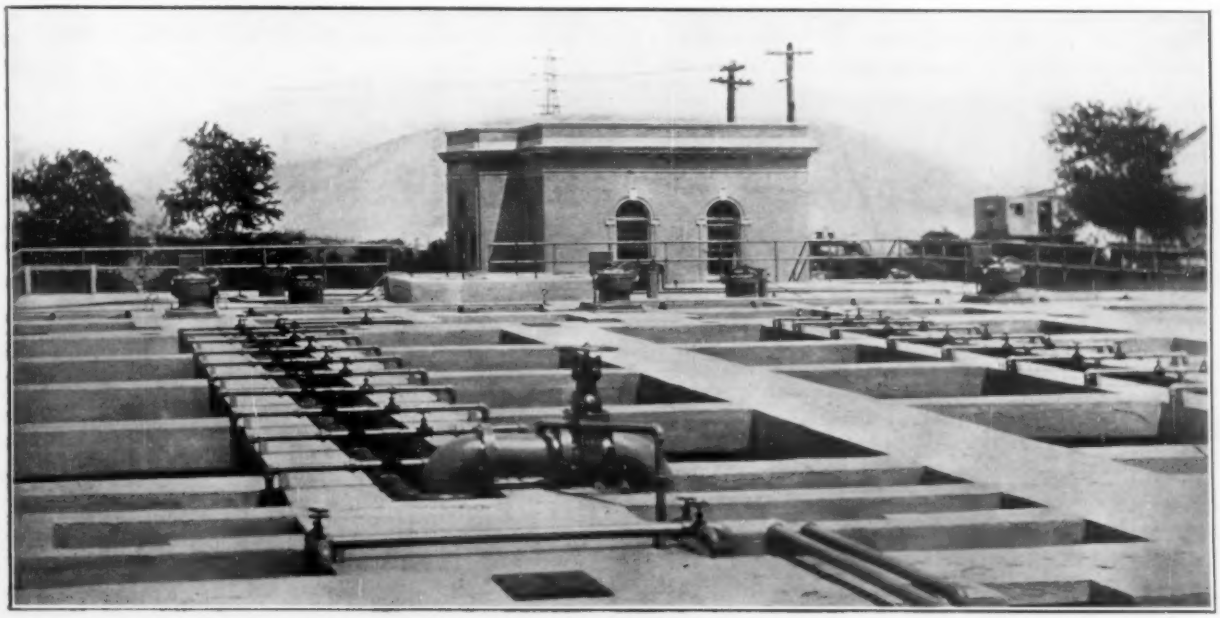
From the preliminary tanks the settled sewage passes to the aeration tanks, where it is joined by the activated sludge returned from the final settling tanks. There are five aeration tanks, each 60 feet long and 10 feet square in cross-section with beveled corners. A sludge return channel runs parallel to the tanks. An abundance of gates permits a variety of flow combinations, but series flow was contemplated and is now being used. Air is introduced by porous tubes suspended above the tank bottom.

Two final settling tanks, each 27 feet square in plan and 8 feet deep, separate the clarified sewage from the activated sludge. These tanks are of the vertical-flow type. Each unit has two influent troughs, each with two down-

drop pipes, so located that sewage is admitted near the bottom of the tanks and at four points, each in the center of a quarter of the tank. Blank flanges hung on the bottoms of the drop pipes deflect the sewage horizontally over the area of the tank. The sludge is drawn down to the center sludge outlet by the suction from the air-lifts, and the motion of the spiral scrapers. The effluent rises vertically and is evenly distributed over the area of the tank by the multiple V-notch weir outlets located on each side of four effluent troughs evenly spaced across the tanks. Each tank has a total length of 160 feet of V-notch weir, insuring low outlet velocities. As the motion of the sludge scrapers is normal to the direction of sewage flow, the agitation of the sludge by the scraper motion is minimized.

The Percolation Beds

The clarified effluent flows by gravity from the final tanks to the percolation beds, eight in number. These are basins dug in the natural soil with the clay removed, exposing the gravel. Wooden troughs distribute the effluent. A portion of the effluent from the final tanks is diverted to a fountain in front of the blower house, as an expression of confidence in the efficiency of the plant.



THE AERATION TANKS, PRELIMINARY SETTLING TANKS, AND SLUDGE DIGESTION TANKS, WITH THE BLOWER HOUSE IN THE BACKGROUND

Sludge Disposal

The sludge from the preliminary tanks and excess sludge from the air lifts is discharged to the digestion tanks adjacent to the preliminary tanks. Each of the four units is 20 feet square with 15 feet average depth. Each tank has a sludge inlet pipe, a displaced liquid pipe and a sludge outlet pipe. The first two pipes have movable sections in the tanks to permit changing the elevation of inflow or outflow. The tanks are tightly covered by a concrete roof. The access manhole and openings for the sludge outlet lift valve stem and chain which support the movable pipe are trapped to permit the collection of gas in the upper section of the tank. As gas collects, the liquid is displaced and discharges into the influent channel of the preliminary tanks. When the gas is drawn off, the tank is refilled by a pipe connected with the bottoms of the preliminary tanks. This arrangement has the advantage of caring for the displaced liquid in a satisfactory manner. As the rate of discharge of this liquid with its high oxygen demand is slow, equal to the rate of gas formation, no sudden load is created that would tend to disrupt the functioning of the aeration tanks.

The blower house is near the sludge tanks. The main floor includes office and machinery room. In this room are a gas-engine-driven generator, gas-engine-driven blower, motor-driven blowers of 300 cfm. and 600 cfm. capacities, panel board and venturi meter registers for sewage and air flow. Downstairs are the sludge pump of the Mudhog type with plungers, and two vertical centrifugal sewage pumps in a dry well, connected to a wet wall outside the building. A low-level section near the plant may be connected to this wet well when developed. Connections to the sludge piping permit these pumps to be used at present for pumping sludge. In separate rooms downstairs are the heating boiler, air filters and lime feed. An electric side walk elevator is provided to convey lime to the lime room.

The sludge piping is interconnected so that sludge may be pumped by either pump, any tank may be drained, and sludge pumped from one digestion tank to another, or pumped from one tank, limed and returned to the same tank. After digestion, sludge may be discharged by gravity or pumped to any of six open drying beds. These beds use the natural sand surface with no underdrains or artificial media.

The gas from the digestion tanks is used by the gas-engine-driven units. These engines may also be run on gasoline, in case of power shutdown, should no gas be available. The engine-driven blower fueled with this gas has been used several hours a day, some days as long as nine hours. It appears that the power bill will be reduced about one-third under present conditions by the use of gas.

Operation

Up to a short time ago the plant and pumping-station were operated by one man. An additional operator has recently been employed, and outside work such as care of the grounds and sludge removal from the beds will be done, when required, by other village employees. The village has the distinction of owning and operating its own water-works, sewerage system and garbage incinerator. As the plant is a small one, it was planning to reduce the laboratory work to a minimum. The only determinations run are settleable solids by the Imhoff cone, percentage sludge in tanks and from air-lift by cylinder, and occasionally a pH of the sludge. Maximum and minimum air temperature and the temperature of the sewage are recorded daily, together with complete records of sewage and air flows, gas used and other operating data.

Seeding and sodding and improvement of the grounds was delayed to permit settlement of backfill and embankment. When the work is completed, the plant should in no way detract from the desirability of the neighborhood. The village also plans to enclose the plant with a wire fence, as the plant is locked at night and left to operate itself. A further reason for the fence is the fact that the operators recently found boys drinking the effluent as it discharged onto the percolation beds.

The movement to establish a sewerage system in Mineola was led by the city administration. The original bond issue voted by the people for the construction of the sewer was $650,000, and it was unnecessary to go back to the people for any additional bond issue. The administration promised that there would be no direct assessments and no increase in the tax rate on account of the sewer construction, and events have justified this promise. The sewer has now been in operation almost one year, and all of the capital charges and operating expenses of the sewer have been absorbed in the budget.

The design and supervision of the sewers and treatment plant were under the direction of the writer. The blower house and pump station superstructures were designed by Abraham Slavin, architect. The detailed design of the treatment plant was supervised by Weston Gavett, and construction of the pump station and sewage treatment plant was sub-contracted to the Sexton Corporation.

Parking Problems of Central Business Districts

"ANGLE parking should be eliminated," is the first recommendation in the report* on the parking and garage problem of the central business district of Washington, D. C., prepared by Miller McClintock, consultant, of the Albert Russel Erskine Bureau of Harvard University, and the staff of the National Capital Park and Planning Commission, under the sponsorship of the Automobile Parking Committee of Washington. Representatives of important business, civic and governmental agencies compose the Parking Committee, which believes "that the automobile terminal problem is of such importance as to challenge the best constructive efforts of those who are responsible for community development," and "that it can be solved economically and effectively only on the basis of adequate facts." The following summary of recommendations will be of interest to many cities faced with similar problems.

"Angle parking should be eliminated, as the 25 per cent reduction in capacity on the few streets where it is now permitted will be more than compensated for by greater regularity of parking and traffic movement.

"The provision permitting double parking should be repealed and a strict prohibition substituted.

"Loading zones should be freely established, with the special provision that they may be occupied by waiting private cars in charge of a driver, where the zone is not required for loading or unloading.

"One-hour parking limits should be continued in the congested district as defined in the official regulations, and this district should be extended southward to B Street and west to 15th Street. One-hour limits should also be applied to any business district in the city.

"A two-hour parking limit should be applied in the district immediately surrounding the present congested district.

"In the near future, parking should be prohibited in the Ellipse and on the Mall.

"Within a period of two years all-night parking at any place in the city should be prohibited.

"To eliminate a large volume of all-day parkers who begin their practice between 8 and 9:30 a.m., it is recommended that parking be prohibited during those hours in the more congested part of the business area as described.

"Twelve, and preferably fifteen, police officers should be assigned to full-time parking duty in the central district."

Conclusions Summarized

The conclusions of the report are summarized as follows:

"It is safe to say that the eventual solution of the parking problem is not to be found along the streets, and, indeed, present conditions are such as to warrant immediate attention to alternative and more efficient terminal facilities.

"While parking restrictions or prohibitions beyond those reasonably required for current use should not be used to force abnormal garage construction, a definite indication of the willingness to apply reasonable restrictions, and a recognition of the ultimate necessity to prohibit when traffic requirements justify, should have a very stimulating effect upon private garage enterprises.

"Provision of garage facilities through the self-contained block plan† should in no manner discourage individual property owners from the construction of commercial garages, or the builders of office or other buildings from plans to incorporate garage facilities as an integral part of their structures.

"No structure should be built in downtown Washington without adequate provision for the off-street handling of commercial movements.

"Garage facilities should be provided for storage space of approximately 1,000 cars in each of five buildings composing the Triangle group of Federal buildings.

"If the proposed garage construction is undertaken, rates should be charged adequate to cover operating charges, together with such part of the construction cost as will not exceed a total reasonable rate."

* See Department of Municipal and Civic Publications in this issue.

† The self-contained business block, as described in the text, "provides for a garage and service building located centrally within the block and connected with such adjacent and surrounding buildings as have contributed to its use. These connections are both for commercial and for personal movement. The structure itself is designed to provide a complete accommodation for all movements of materials to or from the connected buildings. The basement, ground floor, and such additional space as may be required, are devoted to the use of trucks and other commercial vehicles. This facility makes possible the off-street loading and unloading of all commodities, and a great increase in the efficiency of commercial operation. The remainder of the structure is devoted to the garaging of the passenger automobiles of tenants or patrons of adjacent buildings, access being through the connections previously mentioned." This type of construction is recommended where reconstruction of a block is undertaken, because of its advantages in convenience and economy.

LET'S GO!
The Albany Rescue Squad is shown, ready to respond to an emergency call. Note the gas masks strapped to the men's chests

A Year with Our Rescue Squad

By **MICHAEL J. FLEMING**
Chief, Fire Department, Albany, N. Y.

IT would be difficult indeed to conceive of any other addition to a city fire department which would pay the dividends that our Rescue Squad has paid since its organization about a year ago. For a few years previous, we had been aiming at its formation by gradually assembling the best equipment which our own experience and that of fire departments with rescue organizations indicated to be necessary.

Mounted on a Mack chassis is a specially built body, housing equipment that enables our men to cope successfully not only with fires but with disasters and accidents of almost any description. Included in the equipment are the following:

2 McCaa self-contained oxygen breathing apparatus
8 Burrell All-Service gas masks—one for each man
2 M-S-A waterproof first aid kits
2 H-H inhalators
4 blankets
2 wading pants
2 rubber gloves
6 Torridaire hot pads
5 Ammonia hoods
2 U. S. army stretchers
1 Acetylene cutting outfit
Jacks and rigging
Tools, such as saws, drills, bolts and wire cutters
Safety belts

Forcible Entry Sets

The Squad, under the command of Captain Kinary and Lieutenant Fleming, was selected from the men who made application, special attention having been paid to the applicant's record as a fireman, his previous experience and his physical make-up. As a result, the Rescue Squad is manned by crews that fear nothing, that are experienced along mechanical lines, and that have the stamina and determination to stay with a job until it is concluded in the most satisfactory manner possible.

While a number of the rescue men had been overseas in the World War, they could not be classed as men with previous experience in the use of rescue equipment in fire fighting. We therefore selected the equipment that evperience has shown to be the best. The manufacturer, as part of his service, arranged a thorough and severe demonstration of his equipment. The men have confidence in the equipment, and experience has fully justified this.

The Rescue Squad answers all alarms except those in remote sections of the city. As they leave their quarters, they adjust the gas masks in place. Upon arrival at the fire, if there is no need for the masks, they may be doffed in a second. When they are needed, however, there is no delay. And it is astonishing how many times and how successfully we cope with difficult situations, aided by these masks. During the past winter, we were kept busy with an unusual string of difficult, smoky fires. In past years, they would have meant tedious work and considerable loss. The Rescue Squad, upon arrival, ventilates at once, and we make short work of the fires. For this alone, the Rescue Squad has been invaluable.

Many Kinds of Rescue Jobs

Naturally, as the Squad is equipped for the extreme emergency, it is called upon for special jobs of many descriptions. We have the usual run of leaks in refrigerating plants, passenger elevator accidents, etc.

Our experiences with the inhalator have shown the great value of this outfit, which has been used to resuscitate persons who were apparently drowned, gassed or overcome in various other ways. Notable in our experience is the case of prolonging the life of an infant for twenty-two hours after the child was supposedly dead.

Another case was that of a railroad conductor, overcome by gas, and pronounced dead. Fifty-seven minutes after arrival of the Rescue Squad, he was taken to an ambulance, conscious, and he made a splendid recovery.

We do not hesitate to use the inhalators and hot pads on our own men if they are suffering from shock or groggy from smoke or gas. It is the best method of keeping our man-power up to the top notch.

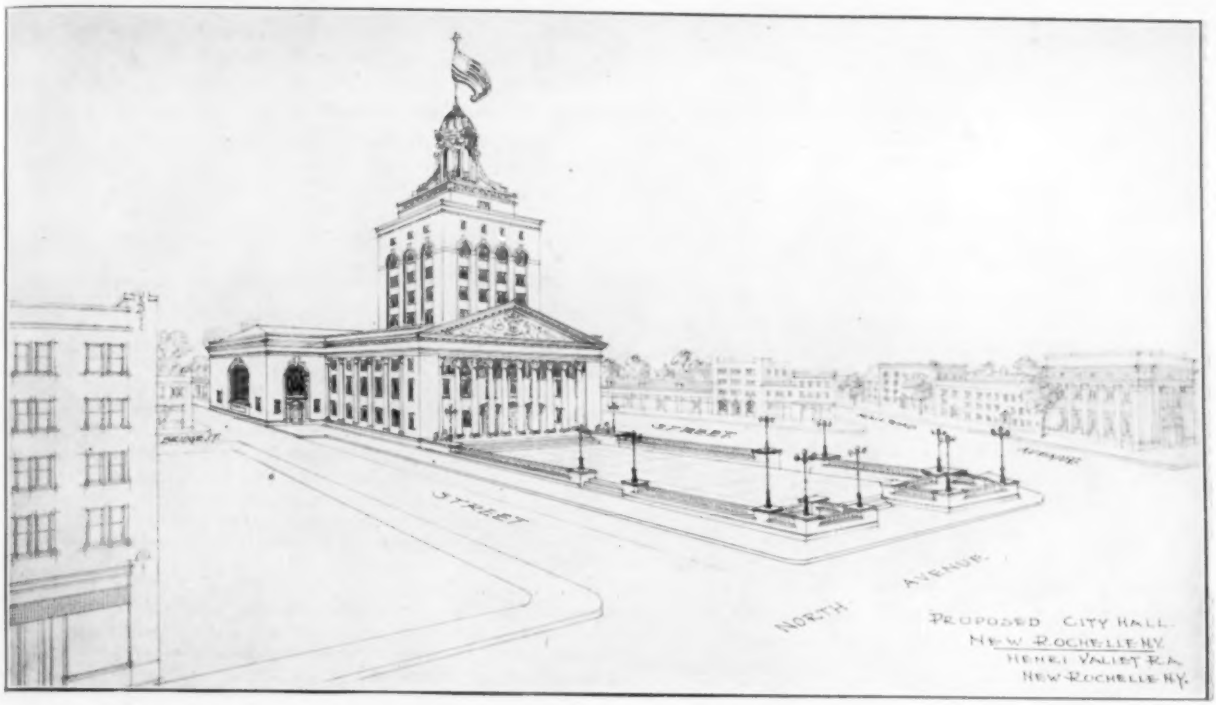
A few months ago a long-distance telephone call was received from Howe's Cave, Schoharie County, N. Y., about fifty miles from Albany. Fumes, apparently from the explosion of 7½ tons of dynamite in a neighboring quarry, had seeped into the cave, and two men who were inside did not come out. Lack of equipment at the cave prevented would-be rescuers from entering. We responded to the call, sending the Rescue Squad. Upon arrival, the men donned gas masks, went down the shaft and made their way underground about one-half mile, to find the first body. They brought it to the shaft, thence to the surface. Again a trip was made and the second body brought out. Meanwhile, the inhalators had been applied and the long, grim battle began anew. Artificial respiration and the inhalator were applied to each victim for a period of about five hours, but without avail. Too long a period in the gas brought disaster. We were there, we had the men with courage, properly equipped, and if anyone could have saved them, we could.

Many other cases could be cited to indicate that the formation of our Rescue Squad is one of the best forward steps ever taken by the Albany Fire Department.

Illustrations 2 and 3 from Knickerbocker Press, Albany

TYPICAL EMERGENCY SQUAD EQUIPMENT

1. A rescue squad wearing McCaa half-hour type oxygen breathing apparatus. 2. Joseph Gattsleiner, of the Albany squad, on a rescue job. He is wearing a pure-oxygen breathing apparatus, and a suit designed to protect the entire body from penetrating poison gases. 3. William Egan, also of the Albany rescue squad, comes safely out of a smoke-filled cellar. He is wearing a Burrell gas mask, which is adequate protection in any case where there is enough oxygen to breathe. 4. An H-H Inhalator is used for rescuscitation work in conjunction with the Schaeter prone pressure method of artificial respiration



A Combined City Hall-Railroad Station Proposal for New Rochelle, N. Y.

By **STANLEY W. CHURCH**
President, New Rochelle City Council

PROPOSALS now pending for the construction of a new joint city hall and railroad station over the New York, New Haven & Hartford Railroad tracks in New Rochelle are the result of intensive study of a situation that has been steadily growing more serious during the last several years. In putting forward the present plan, I had several objects in view:

First, the desire to end a controversy over sites which has been raging for fifteen or twenty years and get the city actually started on constructing some building.

Second, the city hall-railroad station plan seemed eminently the most feasible of some ten-odd plans proposed, as it involves the purchase of no private owner property, thus automatically lifting the proposal out of the realm of petty and personal politics.

Third, the plan has won the endorsement and support of the City Planning Board of New Rochelle, which body ranked it second to their original proposal that the city construct a $4,500,000 civic center, including a city hall, a proposal untenable because of the great expense, the purchase of property involved, and the wrecking of numerous buildings.

Fourth, a new city hall built over the railroad tracks would bring a greater immediate increase in assessment values and consequent tax revenue to the city than a city hall built on any other proposed site.

Essentially Economical

These are the main reasons which impelled me to call on my fellow members of the City Council to appropriate a fund of $5,000 to make a survey of the site; but there are a number of other reasons for this solution of the problem.

One is the matter of cost. The proposal is to construct a modern steel and concrete building on girders over the tracks. This involves the covering of the tracks for an area of three blocks with a broad paved apron or plaza for automobile and pedestrian traffic. Tentative estimates place the cost of such a building roughly at $1,500,000. This, of course, does not include the cost of air rights which the railroad company would necessarily have to assign to the city. Neither does it include the cost of purchasing the parking plaza. The latter, however, cannot be regarded as a deterrent to the plan, because the Planning Board's civic center plan also includes the purchase of the plaza.

Eminently Convenient

The ideal location of the proposed joint building is one of the strongest arguments in favor of it. The New Haven main line from New York to Boston bisects New Rochelle's downtown business area. The station is located just off North Avenue, the city's principal north-and-south business thoroughfare, near Pershing Square, the traffic hub of the business district.

A beautiful city hall constructed over the station would be an immense asset to the city. Such a building would be viewed daily by thousands of New York City commuters, who form a large part of New Rochelle's population.

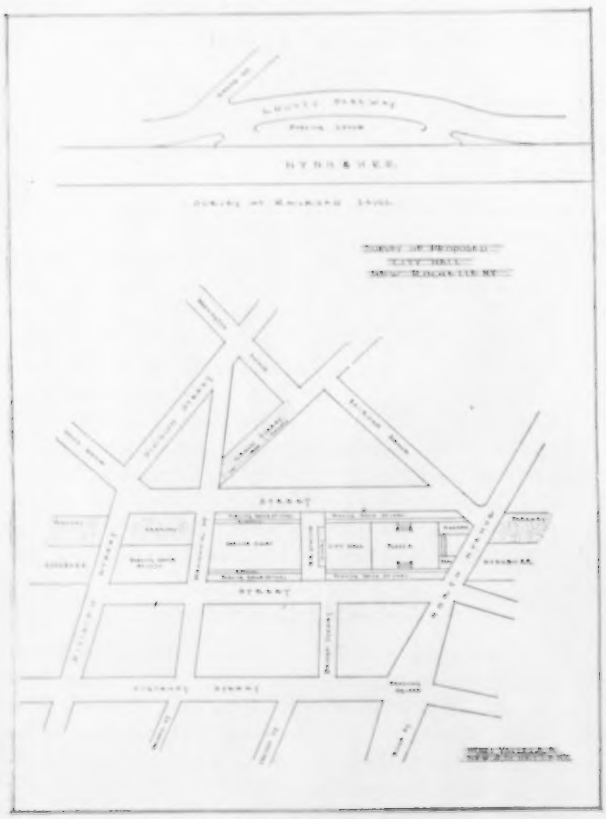
It would also be easily accessible from every section of the city.

A Real-Estate Asset

Provision of ample parking space on the wide plaza would be an advantage of particular value in these days of congested streets. The new buildings also would eliminate what is generally considered one of the city's most undesirable business sections, a stretch of property adjoining the railroad right-of-way now occupied by cheap cafés, pool-rooms, taxi stands, shacks, and so forth. This section is all the more obnoxious and objectionable from the viewpoint of civic pride, because it is the first part of the city seen by the visitor alighting from a train.

Some objection has been raised to the proposed new building on the ground that passage of trains along the four-track main line of the railroad would cause an annoying and disturbing noise and vibration through the building. No less an authority on construction of buildings over railroad stations and tracks than Leonard Schultze, of Schultze and Weaver, New York architects and designers of the new Waldorf-Astoria Hotel, assures me, however, that the building can be so constructed as to eliminate all annoyance from this score. Mr. Schultze pointed out the success of builders in shutting out the noise of subway trains from buildings in the New York area and also the successful soundproof construction of municipal buildings and terminals in other sections of the country.

One of the most direct benefits of the plan would be the opening up and joining of new and old streets through the downtown business district. A motorist, in order to cross the New Haven tracks at present, must go three blocks from North Avenue to Division Street before he can effect a crossing. The plan proposed would connect these intermediate streets with the parking plaza covering the tracks and would tend, in addition to conserving time and distance in making crossings, to relieve a great deal of the traffic now crowding North Avenue.



THE PROPOSED LOCATION

Its convenience to other public services is here apparent, as is something of the complexity of the traffic system

Would Transform a Near Slum

George W. Sutton, Commissioner of Assessment and Taxation of New Rochelle, has this to say about the plan:

"With a plaza connecting all these streets at grade and thus affording new and continuous traffic lanes with the proposed new City Hall and a new up-to-date railroad station in the center of a broad new plaza as a nucleus, we can visualize an entirely different neighborhood. We might thus look forward to a not-so-distant future when all vacant land thereabouts would be built up, and the dilapidated shacks replaced with up-to-date commercial structures, with consequent enhancement of this now more or less neglected neighborhood. This cannot but be most advantageous to the city at large and to its revenues.

". . . . To my mind the benefit that would accrue to the city through the completion of a combined city hall and railroad station on a plaza over the tracks would be greater than would probably accrue through any other plan so far brought to my attention."

Council President Appoints Committee

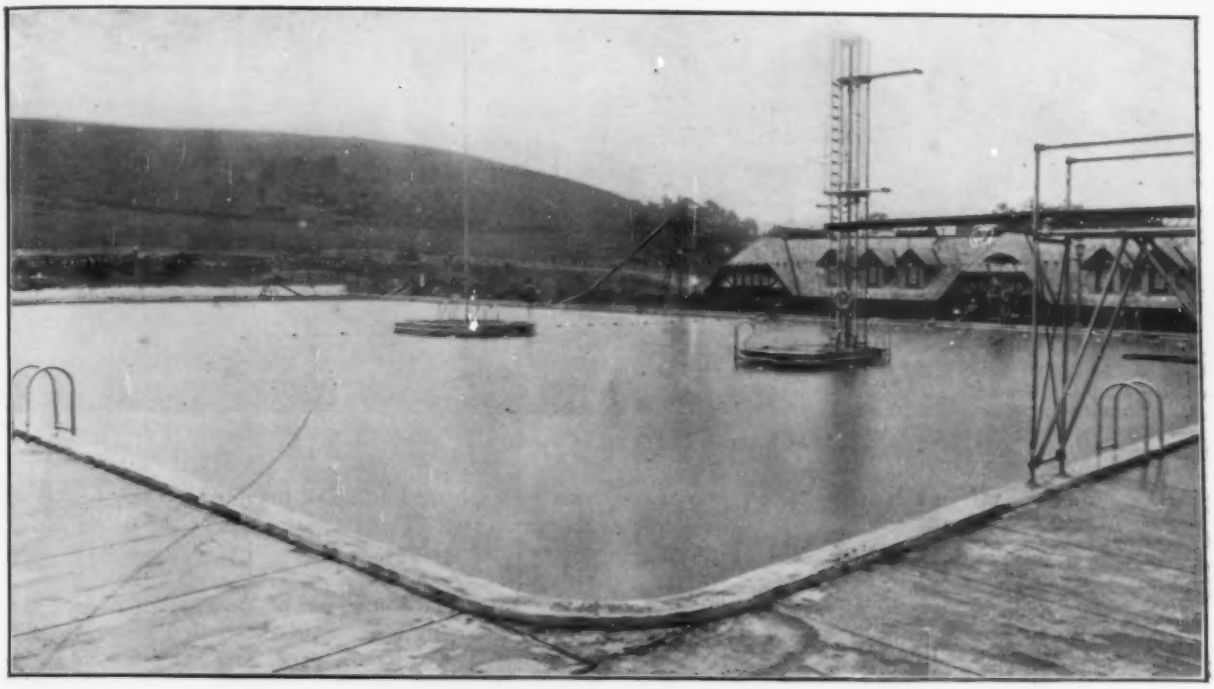
The City Council some time ago authorized me to appoint a committee consisting of Mayor Walter G. C. Otto, Charles F. Simmons, Chairman of the City Planning Board, Corporation Counsel Patrick J. Rooney, and myself, to confer with New Haven officials. This we have done, with results as favorable as were to be expected at this stage. Tentative specifications have been drawn up by Henri Vallet, R.A., according to the reproductions shown herewith. Although I cannot be certain of the outcome, I am hopeful, and intend actively to push the matter until plans are definitely adopted and put into operation. The division of costs of the proposed building between railroad and city is a matter yet to be taken up. So also is the division of space and much of the detail of interior arrangement which can finally be decided upon after many of the problems involved have been worked out in their relation to each other.

Some Action Imperative

The New Rochelle City Hall was built in 1868-71, only a few years after the close of the Civil War. It is an antiquated brick structure, unsightly in appearance, totally inadequate to municipal requirements, a veritable firetrap, and entirely out of keeping with the needs of the fastest-growing city, in point of population, in Westchester County.

New Rochelle now has a population of 54,055, according to the 1930 Federal census. Judging from the ratio of increase established by these figures, the city's population will be more than 100,000 in another ten or twelve years. The new city hall must be built with that approaching population in view.

The old city hall must go. And the logical building to replace it is a handsome new structure that will not only furnish the city with a beautiful municipal building but a fine new railroad station as well.



The Clairton Park Municipal Swimming Pool: An Outstanding Park Development

By JOHN W. MILLER
Superintendent of Parks and Public Properties, Clairton, Pa.

SEVERAL novel features of swimming pool design have been introduced in the Clairton Park swimming pool and bathhouse, Clairton, Pa., which was recently completed at a total cost of approximately $100,000. The project, launched by Vann E. Ohl, Superintendent of Streets and Public Improvements, in 1928, was carried on by the Clairton Lions Club, whiich undertook a campaign to raise $15,000 by the advance sale of tickets to start financing the project. When this campaign developed sufficient momentum to satisfy the city government that there was a real demand for such a pool, the administration actively took hold, obtained plans and specifications, and passed a necessary councilmanic bond issue. The plans were carried to completion by the administration headed by Mayor John R. McVey when it took office on January 1, 1930.

The Underwater Lighting

Of the several outstanding features of the Clairton Park swimming pool and bathhouse, the one which attracts first attention is the system of underwater lighting. The equipment consists of 80 250-watt Aqualux lighting units located in the pool and island walls one foot below the surface of the water. These units light the entire swimming area so effectively that at night it is possible to see any part of the bottom of the pool, even more distinctly than in the bright light of daytime. The lamps are in watertight compartments, which may be removed and repaired, if necessary, in a few minutes' time.

The main pool, which has a capacity of 1,300,000 gallons, is 210 feet long and 130 feet wide, and ranges in depth from 2½ feet to 9½ feet. Adjoining it is a separate pool for children. This is 130 feet long by 15 feet wide, graduated in depth. No other pool in the district has so large an area available for swimming.

Another new feature is the sand beach which adjoins the children's pool. It is 15 feet by 130 feet and contains 90 tons of silica sand, and is equipped with sundry play devices.

The Temperature of the Water

Still another outstanding feature of the Clairton pool is that the water is warmed or cooled by sunlight and natural atmospheric conditions. The recirculation system is guaranteed to produce complete circulation of all water in the pool, so that during June, July, August and September the temperature of the water will not rise above 76° F., and during cool weather will not fall more than five degrees Fahrenheit below atmospheric temperature. When the atmosphere is warmer than the water, the flow is handled through a spray which makes it possible for the water to take on heat from the air; under reverse conditions, the water is brought in below the surface to prevent chilling from the atmosphere.

In addition to the utility of the spray in warming the pool, the 120 feet of arching, sparkling water globules provides a place of amusement for bathers, young and old.

A safety measure in the construction of the large pool is the easy slope of the bottom. This decline is so gradual that it is scarcely noticeable at any point until one has reached a depth of 6 feet. This means that smaller folks

AT NIGHT THE EFFECT IS OF A FAIRYLAND

and non-swimmers will not be stepping off into unexpected dangers.

The Bathhouse

The bathhouse, 130 feet by 34 feet, is constructed of a special rough-finished red brick with a composition gray slate roof, the architecture being of the English style. The interior is open to the roof. The walls are built of glazed tile of the commercial type, and the woodwork is finished in white.

An outstanding feature of the bathhouse is the fact that there are private dressing-rooms with individual hot and cold showers in the women's department. When several women or girls come for a party swim, four larger dressing-rooms in the center provide a place where they can be together. Shower facilities also are provided in these larger rooms.

Each dressing-room contains a bench and has a door that can be secured on the inside. The walls, in and out, are finished in white enamel with metal corner trim in dark green. It is a place of real beauty.

In the men's department there are semi-private dressing-booths, and long benches of unusual width. There is a separate basket section in each department with total provisions for approximately 2,000 containers.

Strict regulations and provisions have been made to keep sanitation at the highest possible point. A soap wash and shower and two footbaths must be negotiated before one reaches the outdoors.

Outside the pool and bathhouse enclosure is the pump and filtration plant. The pump, chlorinator and kindred equipment are housed in a small brick building with the three horizontal pressure filters arrayed alongside, back of the deep end of the pool.

They are constructed to withstand 60 pounds working pressure and have a combined total circulation capacity of not less than 1,200 gallons per minute. The plant turns over 1,369,000 gallons of water in the pool every 19 hours. The functions of each filter are controlled through a series of valves so arranged as to permit washing with either raw or filtered water. The chlorinator has a capacity of chlorinating a maximum flow of 1,600 gallons of water per minute. The entire filtration and pumping plant is separately enclosed.

In the pool the equipment includes diving-boards of varying height and a 25-foot tower with diving-boards at 25 and 15 feet. This large tower is on the island at the deep end of the pool. The smaller boards are arranged along the deep end.

Along the bathhouse side of the shallow end of the pool is a large slide, one of the busiest centers in the plant. In the children's pool there is a smaller slide, close to the spray bath.

For the use of patrons who like to promenade, there is a 12-foot walk entirely surrounding the pool, and the ornamental wire fence at its side is lined with comfortable benches. High above the promenade on each side of the pool there is a seat for the lifeguards. It is located midway along the deep section of the pool and is so arranged that the guards can get away in a dive in quick order if their services are required. Each guard is shaded by a large bright-colored umbrella. Circling the promenade are 22 ornamental Hollowspun granite standards, with octagonal lanterns, set 25 feet apart.

The Attractive Grounds

Outside the pool and plant the surroundings have been leveled and made as attractive as possible in the short time that has been available. Seeding or sodding will follow and shrubbery will be planted. There is ample parking space nearby and it is necessary to walk only a short distance from any such point to reach the bathhouse entry.

Provision has been made for the comfort of spectators by placing many benches on the high embankment between the pool and the upper road. These are largely used. Many more will be added as conditions permit. To make parking alongside the upper roadway more secure, a barrier of heavy telephone poles has been laid at the edge of the roadway, which has been slagged.

Thus Clairton pool represents the latest developed thoughts and equipment that have come out of the experience of pool operators over a course of years. Every sanitary provision, local, county, state and national, is met and even higher standards are set and maintained.

The Aqualux underwater lighting units and the ornamental lanterns and standards circling the promenade were manufactured by the Westinghouse Electric and Manufacturing Co. Wm. B. Scaife & Sons supplied three 8 x 20-foot horizontal filters. The chlorinator is of Wallace & Tiernan make. Fairbanks-Morse manufactured the pump. The architect was J. M. Vietta of Clinton, Ind.

Aeration at the New Waukegan, Ill., Filtration and Pumping Plant

By HAROLD VAGTBORG
Allen & Vagtborg, Inc.,
Consulting Engineers, Chicago, Ill.

ON January 9, 1929, the new filtration and pumping plant at Waukegan, Ill., was put into operation. One of several new features in water-works design that is introduced in this plant is a special form of aerator devised by Colonel Henry A. Allen.

Aeration

Aeration, both in primary and secondary stages, is now well recognized as important in the purification of various water-supplies. Primary aeration is used just before sedimentation and aids in the removal of tastes and odors, carbon dioxide, and iron, manganese, or other oxidizable substances. Secondary aeration is most effective after filtration and chlorination, as it removes any free chlorine and further reduces any carbon dioxide present.

It is generally understood that most tastes and odors in a water-supply are due to certain dissolved gases present, which may arise either in the growing process of microscopic organisms, or through the putrefaction of dead organic matter, such as vegetation found in many sources of supply, or dead algae and other organisms which may periodically grow in water. In the removal of these tastes and odors by aeration the gases and volatile organic substances are displaced by the gases of the atmosphere. The removal of carbon dioxide is a displacement process, the CO_2 being dissipated into the atmosphere.

In the aeration process the dissolved ferrous iron is oxidized into the insoluble ferric iron, which is usually coagulated with alum, ferrous sulphate, etc., and precipitated. Manganese is removed similarly.

In secondary aeration the CO_2 or free chlorine is removed by the displacement process and dissipated into the atmosphere.

As it was endeavored in the design of the Waukegan plant to obtain aeration at low cost of installation and operation, the standard and rather elaborate systems of aeration by spraying or cascading were deemed unnecessarily expensive. Although these methods have in general given satisfactory results, they have the disadvantages of (a) high first cost, (b) high cost of operation because of the great losses of head necessary for effective results, and (c) the fact that the water is in most cases exposed to contamination from the air and the undesirable effects of hot and cold temperatures.

The endeavor to obtain efficient aeration at low cost resulted in the design of an aerator known as the "Air-O-Mix," which is based on the principle of the inspirator, multiplied. Air at atmospheric pressure is sucked in from the air intake by the water flowing past hundreds of bronze

FILTER HOUSE OF THE WAUKEGAN PLANT, SHOWING THE FILTER CONTROL TABLES

tube ends into a mixing throat. The downward velocity of the water in the down-draft tube is too great to allow the entrained air bubbles to escape, and because of the tendency of this air to rise, agitation and thorough mixing results. The air bubbles are constantly being broken finer, forced downward and reduced in size.

Because of this mixing action an ideal location is created at which to apply the chemical, alum in the case of Waukegan, and this is done by extending a chemical feed tube into the mixing throat. At the Waukegan plant the mixture of water, air and chemical continues to mix as it passes downward, and on discharge at the foot of the aerator down-draft tube the water and air pass through specially designed baffled mixers. In other installations the down-draft tube is one leg of a U-tube, the other leg being the updraft tube in which are inserted reversed spiral baffles. Both arrangements give practically the same results, each having advantages over the other in certain cases.

At the Waukegan plant the air stacks are brought together into one common stack over which is placed a small motor and blower which is used only when algae growths are abnormal. Under ordinary circumstances the air stack is left open. The air entering the mixing throat can be varied by control from ¼-cubic foot of air per cubic foot of water to ¾-cubic foot of air per cubic foot of water. The aerators at Waukegan have a capacity of three million gallons daily each and have an outside diameter of only 42 inches. The air used for aeration can be readily pre-washed and chemically charged, if desired.

The Waukegan Plant

The Waukegan filtration and pumping plant is situated on a peninsula at the north entrance to Waukegan, the front of the building facing south. At present a 24-inch inlet main, installed several years ago, extends in an easterly direction into the lake, the outer end being about 3,000 feet from the shore in a depth of water about 25 feet.

As the deep water is in a southeasterly direction, it was decided, on grounds of permanency and reliability, to construct a shaft south of the south Government Pier, it being provided with two openings, one connected to the present 24-inch inlet pipe and the other available for connection, should it be deemed advisable to install a second inlet main extending farther into the lake. This shaft is connected by a tunnel running under the harbor entrance to the wet-well shaft in the plant. An emergency intake is provided for use in case of trouble in the present intake.

The plant is designed on the duplex plan, so that, when required, either half may be run. Arrangements are provided to permit crossing over units of each half. The raw-water pumps discharge through two parallel venturi meters, one for each side, into cast iron grit chambers, from which the water flows into the primary aerator channels. Each of the two channels has three aerators of three million gallons per day per aerator.

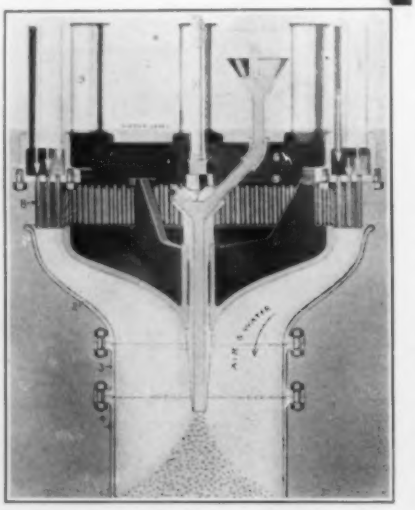
After the water has passed down through the aerator and up through the baffled mixers, where much of the air is liberated together with the objectionable gases that were in the raw water, the water passes down to the bottom of respective covered sedimentation basins. During the 3½ hours in the coagulating basin excess entrained air is freed. From the sedimentation basins the water passes into settled water channels and from there through sluice gates 8 feet wide by 28 inches high to the filter beds. The settled water channels are 8 feet in width, thus permitting low velocity from sedimentation basins to filter beds.

Filter Beds

The filter beds are ten in number, five on each side of the filter gallery. Each bed has a nominal capacity of one m.g.d. and is provided with an underdrain pipe system of special design consisting of a cast iron header set in the front wall of the filter, with 20 tubes projecting across the filter beds in the bottoms of triangular troughs. These tubes are provided with ⅛-inch holes, properly spaced to allow for differences of velocities in various portions of each tube. To ensure integrity of the holes throughout a long period of years, the tubes are made of bronze. Each filter is provided with a completely equipped control table, each table being equipped with substantial push buttons for the operation of wash-water pumps.

Filter Appliances

The pipe gallery is provided with two complete sets of wash water and drain piping, thus completely carrying out the duplex plan system. Beneath the filters and the pipe gallery are situated the clear wells. These clear wells are connected to a clear-well main between the two covered filtered-water storage reservoirs, one on the outside of each sedimentation basin. By means of proper valves one or both clear wells may be discharged into both or either of the storage reservoirs.



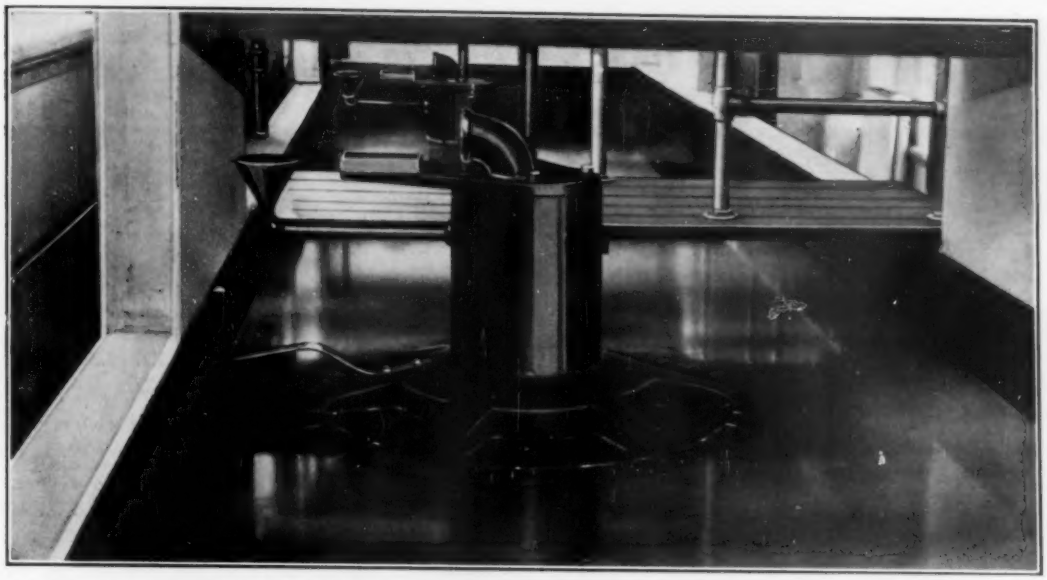
CROSS-SECTION OF AERATOR HEAD AND MIXING THROAT, SHOWING ENTRANCE OF WATER, AIR TUBES, INTRODUCTION OF CHEMICALS AND FLOW OF MIXTURE ENTERING DOWN-DRAFT TUBE

1. Mixing cone. 2. Mixing bowl. 3. Thimble. 4. Down-draft tube. 5. Air tube plate. 6. Air ring. 7. Chemical chamber. 8. Air tubes. 9. Air stacks. 10. Adjusting stem

Special floats and hydraulic regulators are provided to maintain practically constant head in sedimentation basins and filter beds.

Automatic devices are provided for decreasing the rate from a certain predetermined level and cutting off the flow from filter beds when a predetermined maximum elevation has been reached in the reservoirs. At each end of the clear-well main is provided a small basin which connects with the secondary aerator channel.

There are two chlorine booths provided, one on each end of the main pipe gallery, each being equipped with two chlorine machines. These machines are situated above the wells at each end of the clear-well main, the piping leading directly down and the chlorine being discharged into



ONE OF THE AERATOR CHANNELS, SHOWING TWO OF THE THREE AERATORS IN THE CHANNEL

the outlets of the clear-well main.

The secondary aerators are similar in construction to the primary aerators and as the chlorine is applied to the water before reaching these aerators, the chlorine is perfectly mixed when discharged through the aerators into the storage reservoirs.

From these points the water travels between concrete baffle walls to prevent short-circuiting and stagnation, a distance of 1,000 feet before entering the suction main between the two filtered-water storage reservoirs. This gives ample time for the release of excess entrained air and residual chlorine.

Provision has been made for split chlorination, should this be found in actual operation to be necessary.

The plant has been designed for the use of alum for coagulation, but can be readily equipped for other forms of treatment if desired.

Among the special features are the loading platforms at each end of the main pump room, one for receiving the chemicals and supplies, the other to enable a truck to back in under an electric hoist on a hand-operated traveling crane.

Over each bank of filters is provided a traveling crane with an electric hoist for convenience in handling gravel and sand and guarding against all damage to the appearance of the filter gallery when such material, as is often the case, is handled by wheelbarrow and bucket over the filter gallery walls or railings. An automatically controlled safety-elevator is provided to run from the pump-room floor to the chemical and other floors and loading platform.

Sources of Power

The power is supplied by the Public Service Co. of Northern Illinois, which company has entered into an arrangement with the city of Waukegan to permit tapping to each of two main trunk lines connecting their two large power-plants situated in Waukegan. The cables lead through two 6-inch wrought-iron pipes underneath Waukegan Harbor and into the plant at a voltage of 12,000. Both the high-tension and low-tension switch gears are of the Reyrolle type. Two banks of transformers are provided, the switch gears being provided with a selective switch so that in case of anything happening to one of the main power lines, the other bank of transformers is immediately cut in. A hydraulic gage board is used for control of hydraulically operated gate valves from the main gallery. On the main gallery are also situated the recording devices of both raw-water and discharge venturi meters. A gage board containing the various level gages is located on the main gallery at the end of the filter gallery for convenient observation.

Offices and Shops

An office for the superintendent and a roomy well-equipped laboratory are situated on the chemical floor.

There are provided a well-equipped machine shop suitable for making ordinary repairs, necessary locker rooms, lavatories, store rooms, fuel- and oil-storage tanks, coal-storage room and station heating plant with complete equipment capable of using either coal or oil for fuel.

The architecture of the building is of a plain, substantial type. The brick work is seal brown in color with raked joints. The trimmings are terra cotta of light gray stone color. To hold the sand and for convenience in maintaining cleanliness around the plant there are provided suitable concrete roadways and walks. The tops of the filtered-water storage reservoirs are earth-covered and will be sodded. The grounds in the vicinity of the plant will be filled to smooth surfaces so as to give a park effect and enhance the beauty of the entrance to Waukegan Harbor.

The continuous successful operation of the Waukegan plant since the day it was put into service and the excellent quality of the treated water are due in a large measure to the splendid results obtained from the aeration system.

THE MUNICIPAL INDEX, 1930,

contains a section on Water Supply and Purification (pages 383-397)

PICTURES: PLANS: PARAGRAPHS

Photograph by courtesy of Southwest Museum

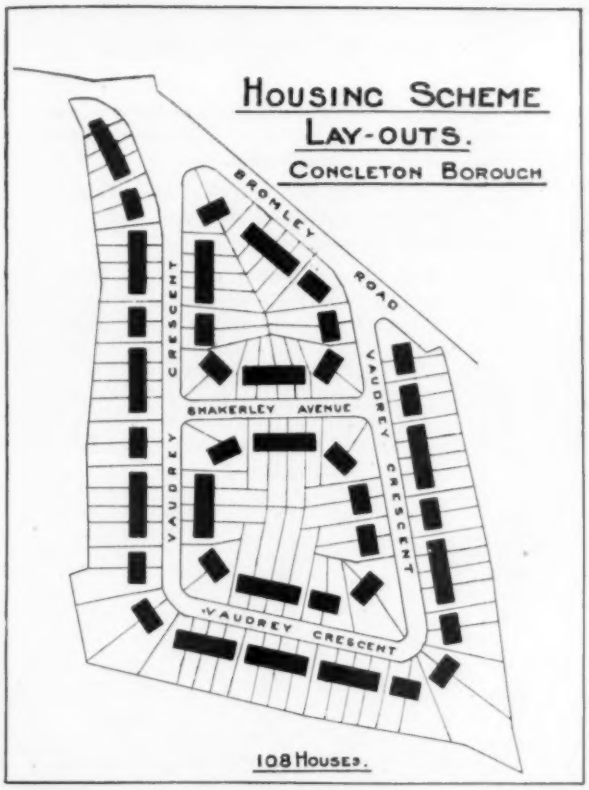
SCHOOL DAYS AGAIN!

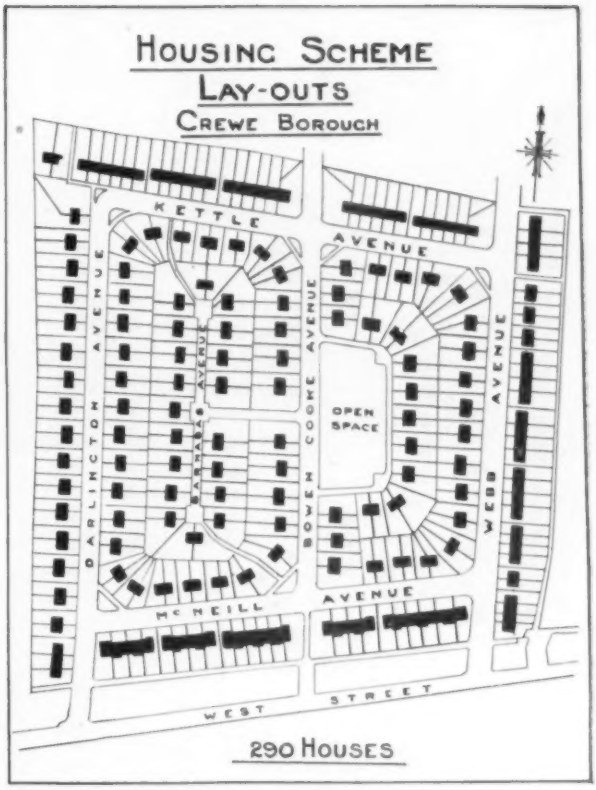
THEY'RE LIKE PLAY DAYS

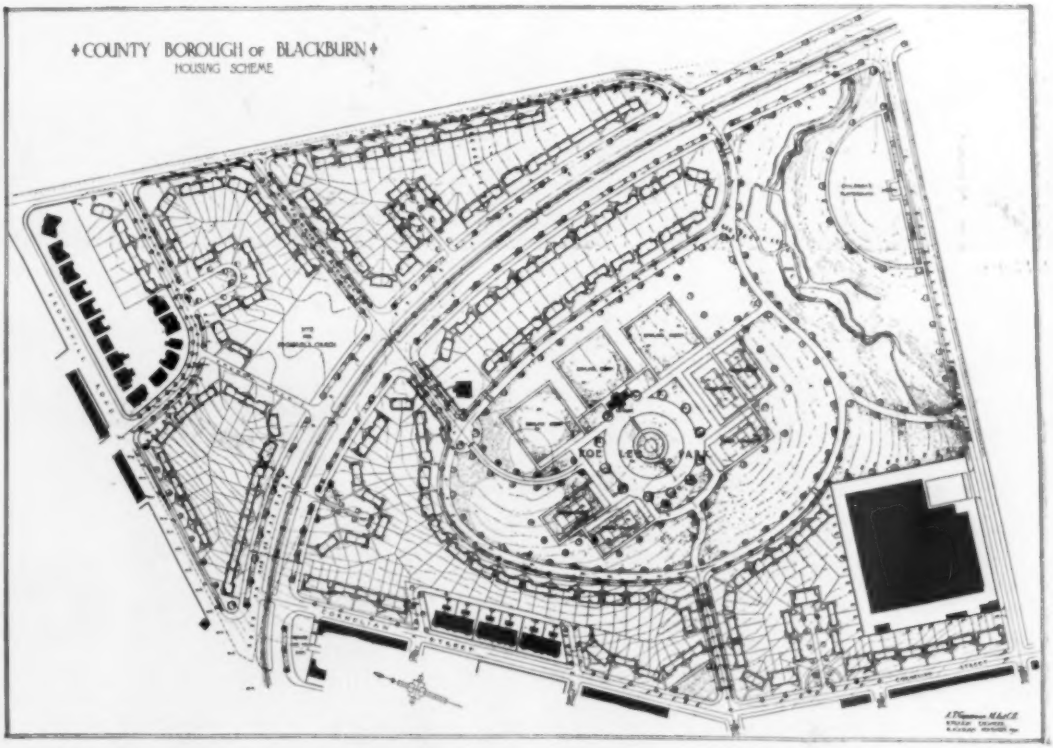
At least, in such places as Los Angeles, where the Southwest Museum has regularly organized grammar grade classes in the history, art and archeology of the section, and in art and handcraft. Any schoolchild may go

MUNICIPAL HOUSEKEEPING AS A CLASSROOM PROJECT

Here active citizenship, business affairs, and many professional occupations are seriously conducted in miniature. All essentials of an orderly, attractive, and well-organized village center are present here. And please note the flowers in front of the City Hall and the stained glass windows in the church. It is a significant fact that there is so much of the essence of real recreation in grade-school work when it is effectively organized along the lines of individual and creative initiative as above illustrated







HOUSING IN THE REGIONAL PLAN

British post-war housing policy, looking to speedy replacement schemes of large scale, interlocks so far as possible with regional development schemes. The two residence-unit arrangements above, with their safety street features, are in the mid-Cheshire Region, where surrounding rural scenery is safeguarded. The layout below, planned by North-East Lancashire officials, shows a well-integrated community unit

© P. & A. Photos

WHERE GOOD AUTOMOBILES DIE AND WHERE BAD ONES ARE BURIED

Thirteen accidents occurred in as many weeks at the spot shown to the left, the automobiles going over the embankment.

Immediately below is a typical scene following a race between automobile and train, for right-of-way at a crossing.

All such derelict bodies as survive traffic wrecks, and others worn out and thrown away, are among the materials being used by the Westchester County Park Commission in the Kingsland Point Park project illustrated at the bottom of the page. Here thousands of automobile bodies are helping convert a marsh and dump ground into an athletic field.

© P. & A. Photos

After excavating 500 feet of trench through the marsh, the powerful clam-shell digger is retracing its course, performing the burials. The open-jaw bucket catches each skeleton in its teeth and drops it into place. The trench will ultimately be about 2,500 feet long, and when filled will be covered with clean earth.

LIGHTING THREE MINIATURE GOLF COURSES IN A PUBLIC SEASIDE PARK

Among the attractions at Jones Beach State Park, an especially noteworthy recreation project developed and operated by the Long Island State Park Commission on a sandy island off the south shore of Long Island, N. Y., are three distinctive miniature golf courses, each of which is floodlighted for night play. The "Alice in Wonderland" course, at the left, utilizes ten floodlights of 1,000 and 1,500 watts, mounted on five poles or masts at a height of 38 feet. The masts themselves are 55 feet high, and are approximately 90 feet apart. This course has an average illumination of 7½ foot-candles. At the right is a view of the "Woodpile" course, showing the 20-foot posts, of which there are six, about 50 feet apart, carrying ten 500-watt floodlights at a height of 18 feet, and producing 5 foot-candles

The night view at the left is a part of the "Alice" course described above. At the right appears the "Davey Jones" course, with poles 22 feet high, about 40 feet apart, each carrying a 500-watt floodlight at a height of 20 feet, giving an average illumination of 6 foot-candles

This view shows the Davey Jones course at night, with the higher lamps of the Alice course in the background, the gate-house of the latter course also showing. The 500-watt units on the courses are General Electric type L 30-A, and the 1,000-watt units General Electric type L 31

Why Detroit Is Contemplating the Incineration of Its Garbage

From a Report Prepared by the Detroit Bureau of Governmental Research, Inc., for the Mayor of Detroit, Mich.

WHEN in 1921, the Detroit Reduction Co. asked the city for a subsidy to enable operations to continue, the Mayor, James Couzens, was in favor of terminating the agreement instantly and accepting an alternate method. Investigation was made into the possibilities of an immediate change.

Shallow burial was considered, and was discarded because no tract large enough could be found near the city.

Dumping into the lake was not feasible, as the Federal Government would not tolerate it and it did not really solve the problem.

Because of the difficulty of removing fishbones, needles, etc., from the garbage, hog feeding was not deemed advisable. Added to this difficulty was the size of the farm necessary and its distance from Detroit, and the uncertainty of the animals' length of life, as well as the fact that it did not provide complete disposal and was apt to create a nuisance.

Incineration was discarded at that period because of the time necessary to design and construct several plants.

The continuance of reduction seemed the only solution. The price of grease was then 1¾ cents per pound. The books of the reduction company were inspected, and a liding rate, beginning with a payment of $3.30 per ton with grease at 1¾ cents per pound, was agreed upon. With each increment of ¼-cent per pound in the price received for grease, the city was to pay 10 cents less per ton for reduction. This agreement was on a day-to-day basis and continued until 1923.

At that time betterments and enlargements of the plant were necessary and these could not be financed on an agreement as tenuous as a day-to-day arrangement. The agreement was rewritten on a yearly basis, so that a year's notice is necessary by either party for the abrogation of the contract. The price agreed upon in May, 1923, was $2.25 per ton, and 10 cents less per ton as the price of grease increased ¼-cent per pound over 6½ cents. The reduction company agreed to spend $175,000 in improvements to the plant by August 1, 1923.

One ton of garbage produces about 60 pounds of grease, or 3 per cent by weight, and it costs about $4 to reduce one ton of garbage. Therefore, before profits may be counted, grease must bring 6½ cents or more per pound, or $3.90 for each 60 pounds, of grease produced from each ton. The market for tankage and other by-products varies, but brings something.

The price paid for garbage reduction has never been charged to the city of Detroit at less than $2.25 per ton since 1923. It is safe to assume, therefore, that the price of grease has not been above 6½ cents per pound in that period, but the hazards of the business are removed and a profit is assured.

Disadvantages of Present System

The plant of the Detroit Reduction Co. at French Landing is one of the outstanding plants of its type, but the odor pervades the entire region, and the plant has had some trouble with the conservation and health authorities of the state during the past few years. Also, the process is not without industrial hazards. The use of naptha in extracting residual grease makes the utmost care a prerequisite of operation.

In Detroit, garbage has received one treatment, and ashes and rubbish another, being used indiscriminately for land fill. The creation and maintenance of two independent coordinate units, covering identical territory and performing similar duties, one often making work for the other, is an expensive and inefficient set-up. As the city has grown in population and area, unit costs have increased until now the total collection costs are rapidly nearing $5,000,000 annually.

Increasing Popularity of Incineration

At the request of the Commissioner of Public Works, several trips east and as far west as Chicago and Milwaukee were made to inspect and report on various methods of disposing of wastes and garbage in other cities. The first of these trips was made prior to the agreement of 1923. Besides investigation of the methods of disposal, the types of collecting and hauling units were also studied. These studies clearly indicated a strong and growing trend toward incineration for the following reasons:

1. The increasing urban population is producing more waste and lengthening the haul necessary under old methods.
2. By proper design of furnaces, planned for high temperatures, with ample combustion chambers and intelligent operation, incinerators may be placed practically anywhere without the creation of nuisance.
3. By intelligently locating such plants, the problem becomes largely one of collection, hauling being kept below an average of two miles.
4. Final disposal of all matter brought to the plant is made at the plant by salvage and incineration, except

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A Valuable Contribution to Garbage and Refuse Disposal Literature

The report, "Waste Disposal by Incineration," prepared by the Detroit Bureau of Governmental Research, Inc., for the Mayor of Detroit, Mich., contains valuable data. The investigation on which the report is based was extensive, detailed and conclusive. The abstract of this report here published gives interesting cost data and observations exceedingly valuable for municipal officials who are considering the installation of incinerators.

for ashes, which may be used to fill. While the value of salvaged materials is not large, the reduction in the amount of material to be hauled is considerable.

5. Garbage and rubbish can be collected in one operation.

Cost of Incineration

It is difficult in municipal affairs of any sort to get a true picture of the financial operations of any department or activity. In operating costs, fixed charges are seldom included, although they are admittedly a part of operating expense. Consequently, when a plant is reported as operating at $1.00 or $1.25 per ton, and comparison is made with one reported as operating at $1.50 per ton, definite comparison is impossible until all factors are known. The cost figures given here have been taken from various sources and are authentic, though not attested.

The cost of an incinerator unit may be estimated at $1,000 per ton of capacity per day. For our purpose, let us assume $1,200 as this cost on a 100-ton plant.

Interest.—Charging interest at 5 per cent, this will cost $60 per ton per year, or 20 cents per operating ton.

Depreciation.—The various parts of a plant have varying life. Approaches, ramps, and the building may be figured at 50 years, and equipment at 20 years. If we assume the ratio of costs of buildings to equipment as 40 to 60, the depreciation figure is approximately 3 1/3 per cent, which equals $40 per year, or 13 cents per ton.

Operating expense.—Labor for 100-ton plant only, per day:

Superintendent, $8.00; clerk, $5.00; chargers, at 60c per hour, $28.80; stokers, at 60c per hour, $28.80; utility, at 50c per hour, $12.00; total of 136 work-hours for 100 tons, $82.60; per ton, 1.36 work-hours, 82.6 cents.

In a larger plant the overhead of $13 would be spread over a greater tonnage, with a corresponding reduction in unit costs.

Occasional labor.—Cleaning out the combustion chamber, flue tubes and chimney every fortnight requires 4 men for 8 hours, or 32 hours at 60 cents, or $19.20. This cost in a 100-ton plant occurs on each 1,200 tons—a cost of 0.16 cents per ton.

Unproductive labor.—This is contingent on employment on a monthly basis, involving payment for Sundays, holidays, vacations, overtime, sickness, etc., for which there is no return. This may run as high as 13 cents per ton and will be included.

Repairs.—Repairs to brickwork are necessary four times annually. A bricklayer and one helper may be necessary for one day, say $20 four times, or $80 annually. This adds 0.3 cents per operating ton.

Supplies.—The only supplies needed are oil for auxiliary equipment, say $1.50 per week. For mason's supplies, once quarterly, $10, or 0.3 cents per operating ton.

Power.—This item is figured at 2 kwh. per ton. At 6 cents, this is 12 cents per operating ton. Light figures at ½-cent per operating ton, and telephone at ½-cent.

Recapitulation.—Interest, 20c; depreciation, 13c; labor, 82.6c; cleaning, 1.6c; unproductive, 13c; repairs, 0.3c; supplies, 0.3c; power, 12c; light, 0.5c; telephone, 0.5c; total, $1.438.

The lining of the furnace, if of the brick-lined type, will be necessary about once in ten years and on a 100-ton unit will cost around $7,000, or $700 per year, adding about 2½ cents per ton, so that the total cost per ton will be in the neighborhood of an even $1.50 per ton. These figures will vary with the various types of furnaces. The steel-lined furnaces with water-jacket will cost more per ton, but repairs to brickwork and relining are unnecessary.

Costs in Other Cities

Miami, Fla.—Of the cities visited, only Miami included the fixed charges in the costs. There are two plants, one of 80 tons capacity in Coconut Grove, annexed to Miami, and another larger plant of 500 tons capacity in the city of Miami proper. A summary of the costs for these two plants for the years 1928 and 1929 follows:

	20th St. Plant		Coconut Grove Plant	
	1928	1929	1928	1929
Tons of garbage and rubbish destroyed	44,550.34	52,883.70	11,761.35	10,958.86
Tons of ashes resulting	11,202.76	12,221.43	2,392.58	1,839.31
Man-hours of labor at incinerator	77,989	69,128	21,660	15,860
Cost of labor	$23,952.95	$20,995.90	$6,701.75	$5,136.00
Cost of supervision	2,406.24	2,502.56	1,276.90	947.42
Cost of overhead, including lights, water, ice, office expense, sickness, accidents, vacations, telephones, etc.	3,828.49	4,050.26	1,107.52	927.20
Cost of hauling away ashes to pits	2,829.98	4,616.56	1,067.52	843.68
Repairs and maintenance	1,966.62	3,459.69	136.08	314.71
Totals of direct costs	$34,984.28	$35,624.97	$10,289.77	$8,169.01
Cost per ton	78.5c	67.5c	88.9c	74.5c
Man-hours per ton	1.73	1.37	1.84	1.44
Interest at 3 per cent	$16,055.39	$16,035.57	$3,340.17	$3,367.26
Depreciation	27,034.68	27,107.64	5,327.57	5,895.98
Totals of indirect costs	$43,090.07	$43,143.21	$8,667.74	$9,263.24
Total of direct and indirect costs	$78,074.35	$78,768.18	$18,957.51	$17,432.35
Total cost per ton	1.75	1.49	1.61	1.49

Toledo, Ohio.—Two years ago this city built two 100-ton incinerators of different types to dispose of garbage, using coal as the fuel. The city does not collect its own rubbish. The data obtained from Toledo covered only the first few months of operation. Fixed charges were not included, but the cost of the fuel was, and under this condition the average for the first five months of operation was $1.683 per ton.

Toronto, Ont.—The costs of operation at the two Toronto plants as submitted over the signature of George W. Dies, Street Commissioner, are as follows:

Operation	Don Destructor	Wellington Destructor
Wages: foreman, weigh clerk, stokers, laborers, etc.	$70,791.90	$80,889.80
Garage service, removal of ash residue	1,929.17	3,205.05
Light	180.42	1,307.54
Power	1,648.76	
Water	115.58	238.14
Supplies	716.02	1,647.23
Accounts payable, December 31, 1929	1,194.92	1,428.13
Maintenance		
Wages of repairman	1,590.00	1,731.60
Firebrick, cement, etc	934.64	1,146.18
Sundries	22.75	
Accounts payable December 31, 1929	883.97	780.42
	$80,008.13	$92,373.49
Cost of plant, exclusive of site	$225,000.00	$550,000.00
Depreciation at 5 per cent	11,250.00	27,500.00
Interest at 4½ per cent	10,125.00	24,750.00
Total	$101,383.13	$144,623.49
Tonnage destroyed in 1929	57,728	83,323
Cost of disposal per ton	$1.75	$1.73

Nuisance

Special investigations were made to determine to what extent incinerators are considered nuisances in the cities where they are installed, and it was the consensus of opinion that it is possible to create a nuisance if there is an inclination to do so. The modern plant is designed to do certain things in a certain way, and any deviation from the prescribed routine will bring trouble. In firing any

boiler with steam coal, until the furnace is heated up some smoke will be produced. Similarly, any attempt to incinerate garbage before the furnace is hot will inevitably produce nauseous gases and vapors that will escape up the chimney. Dry rubbish burned in sufficient quantity before charging garbage will set conditions right for the complete combustion of all the gases before they reach the chimney.

In Miami, under practically tropical conditions, the larger incinerator is operating within 150 yards of the City Hospital without complaint. In the Coconut Grove section, the incinerator is located in an L that juts into the exclusive city of Coral Gables, and no complaint has been registered by the residents of that city.

Reduction in Hauling Costs

Entirely aside from the possible economies in disposal costs, is the reduction in hauling expense.

On the basis of 9 yards per load, it is estimated that the cost of hauling rubbish is 6.5 cents per yard-mile. In an effort to find cheaper transportation than hauling by truck over a 6-mile haul, an arrangement was made with the Detroit Street Railway some two years ago by which rubbish has been hauled from the North Western Station at Buena Vista and the Belt Line Railroad to the Chrysler dump on the east side of the city. This is done in differential street cars of 40-yard capacity. Trains of two cars and a motor, with a total capacity of 120 cubic yards, are hauled over this route, 13 miles, at a cost of less than $0.015 per yard-mile. Cheaper transportation in Detroit will be hard to find. With the Chrysler dump practically gone, it may be possible to find another dump accessible by rail, but probably none will accept the miscellany that went into the Chrysler dump.

If and when incinerators are operating, the haul of incinerator ashes by truck to any dump will be cheaper than hauling the rubbish to the dump. Probably 10 per cent of the combustible material will be ash, since the present plant contemplates the removal of everything not combustible by salvaging. So the long haul will be reduced to household ashes, plus 10 per cent of other combustibles by weight.

Of the approximately 500,000 tons of rubbish that is not ashes, going to the incinerators for reclamation or incineration, all that comes out as salvaged material will be sold or given away at the station. The city is then through with it and, of the rest, the ash will be all that is left. This must be hauled away, of course. If clean, it can be used in any land fill, or possibly given or sold to the railroads or used on unimproved roads.

At the present time the figures of the Division show an average hauling cost of upwards of 70 cents per yard, or a total of $1,428,000. On the basis of 600 pounds per cubic yard of wastes collected, not including garbage, and an average haul of 5 miles, it has been estimated that the cost is 46.6 cents per ton-mile. The collection charges are about 40 cents per cubic yard, and the dump charges about 6 cents per cubic yard. Collection charges should be no greater with incineration, and the use of standardized equipment may lessen the costs. The dump charges should be less per unit as well as in total, since the yardage at the dumps will be reduced to the yardage of ashes. However, these will be minor economies, and the principal gain will be the result of the shortened haul. If the average haul is reduced to 2 miles, the total cost will be approximately $570,384, a saving of about $855,576.

In hauling to the dumps a large part of the cost is occasioned by the difficulty and, at times, the impossibility of driving a full load into the dump. In hauling to the incinerators, the roadway will be paved up to the charging doors or to the hopper.

The same relative economy is possible in the hauling of garbage. The average haul of garbage is now a little less than 5 miles, and the cost 10 cents or more per ton-mile. If the length of haul is reduced to 2 miles, this would make a saving of approximately $471,000 in the cost of hauling garbage, which, together with the saving of $353,250 in the cost of disposing of the garbage and $855,576 on the haul of rubbish, makes a possible total saving of $1,679,826.

Additional Costs of Incineration

This, however, is not clear profit. Incinerator plants of 1,800-ton daily capacity will cost in the neighborhood of $2,500,000 to $3,000,000, or an average of $2,700,000 each. With interest at 5 per cent and depreciation at 5 per cent, this would cost $270,000 per year.

On the assumption that 500,000 cubic yards of ashes will not go through the incinerator, there will be operating charges on 157,000 tons of garbage plus 1,540,000 cubic yards, or 337,000 tons of rubbish, or a total of 494,000 tons. Available figures indicate a labor cost on incineration of $1.00 or less per ton, which would make the cost of incineration approximately $500,000.

The ashes from the incinerator must be disposed of. Much of this output may be used on unpaved streets for some time, but ultimately all ashes must go out of the city. If this is done on the basis of the present hauling by the Detroit Street Railway at $0.015 per yard-mile on a haul of 15 miles, there would be a cost of $112,500.

The total estimated additional operating costs chargeable to incineration would then be approximately $882,500, leaving a net possible saving over the present method of $797,326.

An unknown quantity of metal may be removed from the rubbish and sold. The labor of doing this should be fully covered by the $125,000 now spent on dumps, so that any revenue from salvage should be in addition to the savings mentioned. In addition to this item, an unknown quantity of clean ashes may and will be used directly on the alleys and unpaved streets of the city.

The Present Contract

Under the terms of the present garbage contract, the city must give notice of one year before it may terminate this agreement and, until it is terminated, the city must deliver 99 per cent of all garbage collections to the reduction company. Thus, the use of incinerators must be limited to rubbish until the city is ready to send its entire garbage collection to its own plant. A collection of 180,000 tons of garbage annually means roughly 600 tons per day. The capacity of a $250,000 unit might be 250 tons daily, of which 30 to 40 per cent must be rubbish in order to burn the garbage. This means that the two projected incinerators might dispose of 300 tons, or half the garbage, which may not be done under the present contract. It might be possible, however, to negotiate a new contract which would enable the city to gradually decrease the percentage of garbage to be delivered to the reduction company.

Planning to Make Hometown Livable

By KARL B. LOHMANN
Professor of Landscape Architecture,
University of Illinois

Opportunities for Comfort, Spaciousness and Order in Small Communities, Which Most Large Cities Do Not Possess

IT does not necessarily follow that because a town is small it is livable, or that because it is large it is unlivable. It is true, however, that the opportunities for achieving and maintaining health, comfort, safety, and other favorable characteristics, are more readily within the grasp of the smaller town. The town, like the child, is more pliable than the grown-up city. The mistakes of the small town lie within the realm of relatively simple correction, and its future growth and expansion are readily capable of being directed along healthful, well-coordinated lines. Planning for livableness in Hometown is likely to be a hopeful task and therefore decidedly worth the effort.

Planning, on the one hand, is a *visionary* process helping to *visualize* better conditions; and, on the other hand, it is a *practical* process which helps to *materialize* those better conditions. Before we plan we must know what we are planning, what we are trying to correct, avoid and achieve. We must guard ourselves against a lazy indifference to the unlivable conditions to which we have become accustomed. We must open our minds as freely as possible to new needs and new possibilities.

Let us keep in mind that ideas of betterment intended to make life more livable in a community, whether they apply to the built-up sections or to the newer sections, are, if for no other reason, important to think upon in the light of change and growth, for nothing is more nearly universal among our towns than such change and growth.

Complete rebuilding of older portions of communities is no more unusual than new growth and expansion over previously unoccupied territory. As we contemplate the layout of the present and future average home town, we must plan, therefore, to think both correctively and preventively.

A HINT FROM ENGLAND
In Letchworth Garden City a sense of seclusion is assured for the residents by the combination of a planting strip inside the walk and a board fence with planting

Lessening the Menace of Automobiles Among the Homes

One of the first things that we need to consider is the effect upon the living arrangements of the community, of noise, confusion and danger incident to the use of automobiles. That effect, as we all know, is a vital and growing one, reaching to all parts of the municipal structure. It is seen especially in residential streets, which the increasing traffic of automobiles makes more and more inadequate and unsafe. Little, relatively, has been done toward minimizing this menace to health and life. However, such indifference seems to be passing. The latest

BAD SIDEWALK PLANNING
Here an abrupt step-off is a definite danger to the pedestrian

AN INVITING WALKWAY
Its paved central area is flanked by a planting strip on the one side and a hedge on the other

A COURT OF SHOPS
One of the intimately planned groups of a Hollywood business section

real estate reports from over the country indicate that purchasers are gradually tending away from major streets as places of residence. This substantiates significantly the need for remedial efforts.

For those homes that are already in existence and for those streets that are already laid, there is perhaps little that can be done to improve conditions, short of a radical rearrangement of both homes and streets. There are, however, one or two palliatives that might be applied.

Obviously, the more you can separate the home from traffic, the better. Where the home is to remain and the traffic is to continue as before, the means of separating these two are decidedly limited. Our principal reliance will need to be on some kind of barrier or separating enclosure at the front line of the property. Front-yard developments of an open character in recent years have resulted from a desire to achieve a more open, democratic arrangement, as distinguished from the secluded one of previous times. As these open developments came into fashion, enclosing fences and hedges for the most part disappeared. This, however, took place without thought as to how automobile traffic was to affect the situation.

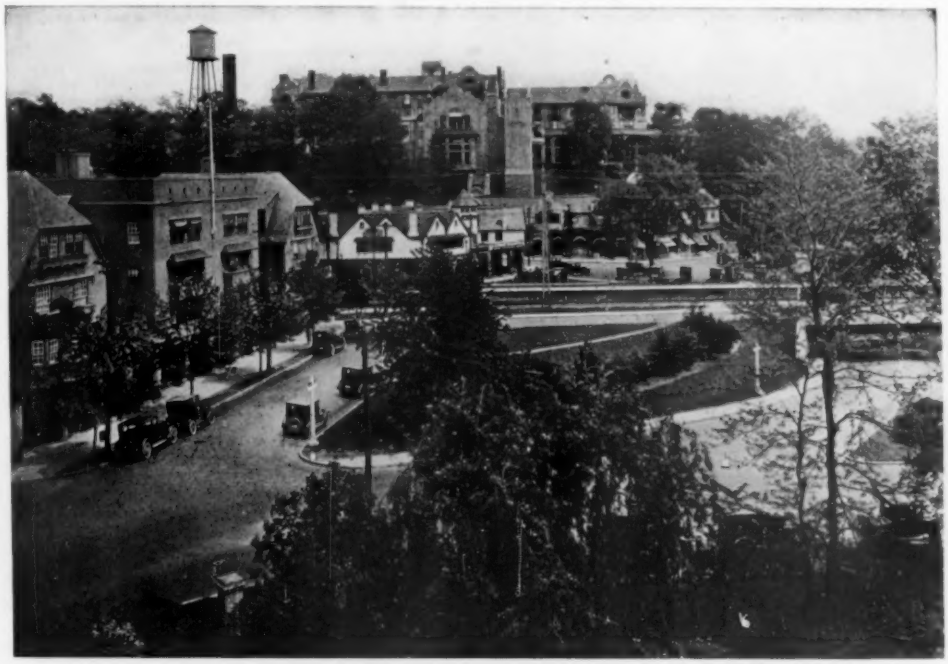
There is much to be said in favor of some sort of barrier along the front of the property. It serves to encourage small children to remain in the yard, or as a barricade-like buffer against sound. At least it gives the appearance of separation and seclusion. With these things in mind, why shall we not further encourage the growing of hedges such as we now see occasionally across front yards? Where we desire even a more complete enclosure than the hedge can give, we may introduce a fence inside the line of the hedge. These features may be supplemented by masses of companion shrubbery or trees of such character and height inside the yard as shall be compatible with good composition and the surroundings.

There are at least two things that can be done to make the sidewalk seem safe to the pedestrian. One of these is to introduce a barrier of space between the sidewalk and the street. Ordinarily, in a residential neighborhood, more room or space along the sidewalk cannot be secured unless both the pavement and its sidewalk are to be repaved. The time to think of any revision of the cross-section of the street is before the new improvement is undertaken. This is especially necessary in case there is a disproportionately narrow space between curb and sidewalk. Such a restricted space between sidewalk and curb is about as bad as the complete absence of space between sidewalk and pavement. Conditions like these constitute a menace that should not be permitted to exist.

Another of the things available as a safeguard to pedestrians, especially to small children, is a low-trimmed hedge between the sidewalk and the curb. Its purpose is

A RESIDENCE STREET IN LONGVIEW, WASH.
Here, in a town scientifically planned and developed in accordance with its plan by a large lumber company, many of the ideals of good everyday living are realized

to serve as a protecting fence from the street, and upon a few occasions it may even take the form of a fence. The line of such a barrier needs to be broken at private drives and walks, and to be set far enough back from the curb for the convenience of persons whose cars are parked at the curb. To be sure, this suggestion, coupled with a previous one, would produce an effect of hedges on both sides of the sidewalk, but if ample space for circulation of pedestrians exists on and near the sidewalks, such an effect should not only contribute to the safety of our residential streets, but should also provide more of the park- and garden-like quality that our streets so frequently lack.



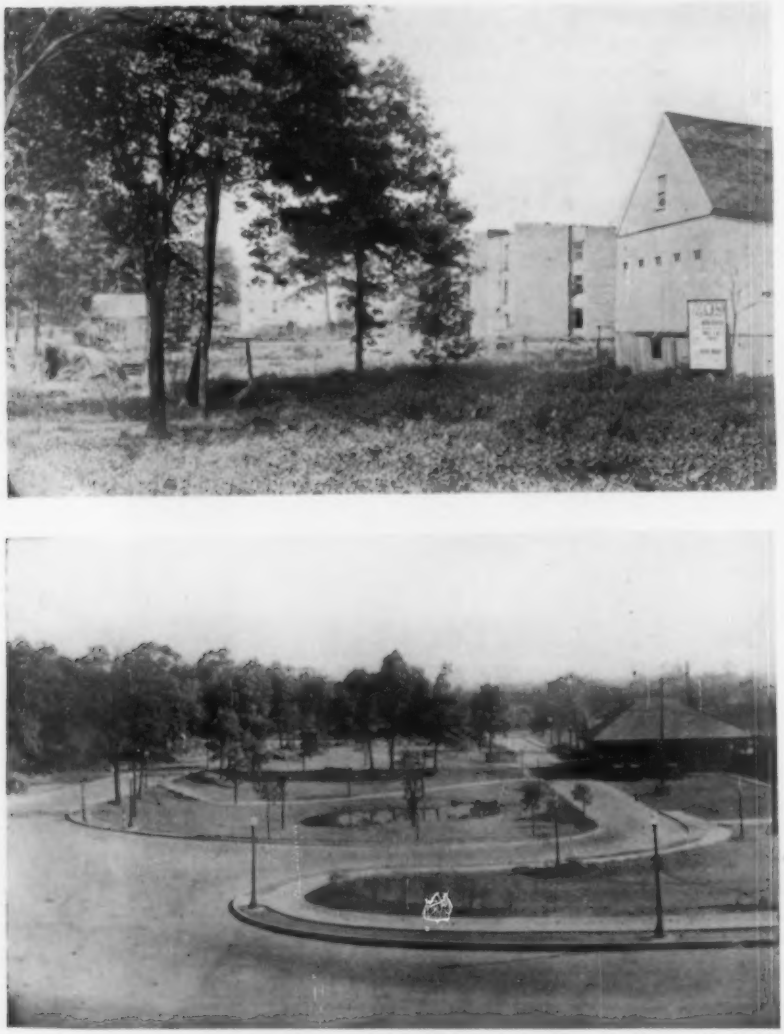
THE RAILROAD PLAZA, BRONXVILLE, N. Y.
The contrast of this planned suburb with the disorder, congestion, and noise of New York City accounts for its popularity with commuters. The station layout includes parking facilities

On properties as yet agricultural but within the range of future growth of Hometown, freer thought should be given to planning residential areas for the quietness and safety that the motor age requires. Indications point to the fact that our people are showing a preference not only for having their homes along non-traffic, even dead-end, streets, but for an entirely new idea of arranging the homes to back upon those streets. As a consequence of such reversed arrangement of homes and thoroughfares, the fronts of houses will face upon what formerly were considered the rear yards, and will look upon that plebian feature of the past, the alley, which, with a new dignity, and perhaps a new name, will lead as a front walk between handsome flanking gardens.

Giving Thought to Spaciousness

Another thing that challenges our attention in the interest of a livable Hometown, is the need of preserving and planning for spaciousness. The example of the great cities in this respect should not be allowed to mislead us. Just because these cities are choked to suffocation by almost 100 per cent occupation of land and sky, is no reason why the smaller towns should imitate their unfortunate prototypes. One would think, to see our metropolitan centers, that man was meant to be "herded in tubes, shot up in lifts, poured up and down escalators, lifted, dropped and swept this way and that." On the contrary, man seems to crave, and seems much healthier and happier when he is provided with, elbow-room, space in which to move, space in which to look out and up, space in which to breathe and in which to enjoy the light of the sun. The ideal of spaciousness can be said to apply to the entire fabric of the town. It applies to those portions of the community that by corrective effort may be made to conform more nearly to the pattern of what they should be. It also applies to those areas yet to be built upon. Whether

HAWTHORNE PARKWAY, SALEM, MASS.
Where modern traffic requirements are met and the historic dignity and charm of the town are emphasized. The first of the three monuments shown is that to Nathaniel Hawthorne



A RAILROAD STATION PARK DEVELOPMENT

At Larchmont, N. Y., another suburb of New York City, the site shown in the top view, which lay along the New York, New Haven and Hartford tracks, has been transformed by the town of Mamaroneck (of which the village of Larchmont is a unit). The bottom view shows its present appearance

standing alone, or merging with common party-walls into apartments, our homes must have adequate spread of land about them. We have it in our power to prevent the building of homes with too little open space in connection with them. The worst offender in this respect has been, and is likely to be, the apartment house.

Even in suburban towns, apartments have been known to occupy almost entire ground areas. They have often been built with the idea of accommodating as many families as possible on a given piece of land. If Hometown is to be livable in this respect, it must require a setting for apartments, a reserved open area commensurate with the number and requirements of the families that are to be accommodated (say 500-1,500 square feet of open space for each family).

There should certainly be no objection to developing a unit of apartment dwellings on an entire block or on two blocks, provided it is an architecturally homogeneous one and a good one, and affords outlook upon generous open gardens and play spaces. No town ordinance should —although some do—stand in the way of such a development, provided it is well planned and appropriately located.

We are coming to realize the desirability and need, in this motor age and in our home towns, of bringing spaciousness in the form of liberal park and garden areas as close as possible to every home. The most nearly ideal way to fit this requirement would be to provide a park in the middle of every block. To do this, however, our blocks must be large, a great deal larger than the ones we see each day, perhaps three or four times their size, so that something of the real effect of the breadth and openness of the countryside might be enjoyed. Around each of these blocks could be arranged the homes, perhaps groups of homes. Block after block, as in the new town of Radburn, N. J., could be connected not only by areas of parks, but by walks that for safety at the streets should be of the underpass variety. Interior block park areas, though of necessity diminutive, might be introduced even into the built-up sections of towns.

Because congestion has been so largely inspired by profits and exploitation, it seems opposed, in principle at least, to the idea of spaciousness. Those few who are benefited by congestion, in so far as it encourages the pyramiding of values and costs, may find it difficult and inconvenient to oppose the cramming and jamming of the land. A full appreciation of how public health, comfort and safety are related to this question should inspire us to declare for a policy of spaciousness; and even from an economic point of view, spaciousness, like honesty, will be found to be almost always the best policy.

Planning for Convenience

To make Hometown livable, another thing that we need to do is to plan to make it convenient. As part of the daily outdoor program of the occupants of every home, there are trips that have to be made, some of these to the downtown, and some into the local neighborhood. It is obviously essential that the downtown should be not too far away, not too difficult to get to, and that the center to which we go shall, by virtue of its compactness, contribute to a saving in time and energy. One of the great advantages of the small home town, is that, in order to get to town or to office or to shop, one does not have to ride in stuffy, crowded street cars or subways, under frightfully unhealthful and tiring conditions. Even the advantages of relative proximity to a downtown, may be offset by narrow, obstructed roadways. It may mean the widening of the roadways, one type or another of proper control of

the traffic, and adequate facilties for the parking of automobiles within the business section of the town.

In the interest of both compactness and beauty, Hometown may find it desirable, not merely to encourage the development of stores along the streets as heretofore, but to group the more leisurely types of business around open courts. This would be on the order of similar efforts successfully carried out in Santa Barbara, Calif. Furthermore, the achievement in the shopping centers of a livable quality is possible through a larger use of trees, and not, as is so frequently the case, the diligent elimination of them where they do exist. Some small towns have done that purely to imitate the cities. It would be better to leave a strip of the sidewalk in gravel or to protect the roots of the trees with large, open iron gratings.

Another objective of daily trips from the home is some place uptown, near home, which may include the school, the local shops, the local movie, the park, or our neighbors. As a rule, in the plan of the town there is no recognizable effort to provide for the building of neighborhood units. Our towns are decidedly hit-and-miss in this respect. Rather should our town plans be a composite of neighborhoods, a great pattern of them representing perhaps a number of satellites that are tributary to the central planet, the downtown of the municipality at large. How much more livable the town as a whole would be if divided into areas, each perhaps several blocks in size and large enough, say, to accommodate all the families served by a single elementary school. Such super-areas would be bounded by main traffic streets and served by shops at the corners. Within these neighborhood units, where only local traffic would penetrate, would be the school with its accompanying playground and the homes of the neighborhood unit.

The fixed, built-up character of an existing town obviously makes the establishment of a new pattern of such neighborhoods seem impractical. Yet in the newer unoccupied portions it should serve as a practical ideal. Even in the built-up sections the neighborhood idea could be borne in mind, and in some instances might be at least approximated.

Striving for Order

If we plan to make Hometown livable, we must plan to keep it in order. That is to say, we must consider what we would do in the home if we were to put it in order, and then with equal appropriateness apply that process to the town at large. Striving for order in the home suggests an effort to have everything in its rightful place according to the services that are to be performed. Just as rooms and their furnishings are divided and arranged according to suitability for service, in like manner portions of the land comprising the community are set apart for various uses. They are more suitable for some of these uses than for others, according to a variety of conditions that must be determined. There are sites for centers of various kinds. There are places that serve best for business of the lighter sort and for business of the heavier sort. There are places for residences away from the danger of traffic, the danger and annoyance and nerve-disturbing effects of noise of all kinds. There are properties for parks along the rivers, lakes, hillsides and rocky cliffs. In fact, the most logical and reasonable places for all the activities to be expected in a normal town organism should be allotted to positions where they most logically belong. More frequently than otherwise, however, they are not so placed and instead are permitted to intrude upon each other, chaotically, to the detriment of property values, of efficiency, of the life and beauty of the community.

The best-known housekeeping agency for restoring the town to order, and for keeping it in order, is zoning. Under this regulatory means, unless Hometown at large endorses them, spasmodic changes in the character and use of neighborhoods are impossible. An indication of the widespread belief of the importance and value of conforming to an orderly program of use, height and bulk, by zoning, is the fact that in the United States more than

WHAT PLANTING WILL DO FOR A PLAYGROUND
One of the demonstrations made in Salem, Mass., that active play areas can be beautifully developed

750 towns and cities (affecting 37 millions of inhabitants) have adopted zoning ordinances.

Planning for Beauty

So frequently and naturally does beauty seem to develop in the company of practical matters, that when thought and attention are given to such requirements as quiet, safety, spaciousness, convenience and order, it would seem as though beauty should spring forth from these automatically. Indeed, in a larger sense, it does. Furthermore, there can be no realization of the practical without giving adequate thought to what is beautiful. People were meant to live in agreeable, comely surroundings, free from congestion, inconvenience and disorder; free from preventable noises that offend the ear; free from hideously colored filling stations, or over-large, over-used, misplaced and self-glorious billboards that offend the eye. People were meant to live in towns replete with homes and other structures that are well placed, well grouped, well designed, in towns that possess the country-like, heaven-given, qualities of openness, verdure, air and light.

A SPACIOUS SCHOOL YARD
Where fencing assures safety

Conclusion

The writer has pointed out a number of requisites that are important to the creation or preservation of the livable town. He has not attempted, however, to cover all phases of the subject. Local organizations must obviously give attention to such civic needs as an ample supply of pure water, an adequate sewerage system, good schools, clean streets, efficient health and fire departments, together with the many other needs of a modern American community.

To let Hometown develop at random, without forethought and without strictest regard for the requirements of living, working and playing, is no longer fashionable. Not only the features enumerated in this discussion as worthy of accomplishment, but numerous other findings as well should be incorporated into a comprehensive and fully coordinated plan. That plan should take into account the items of economy, convenience, health and happiness. It should be the kind that may be turned to as a guide for practical, orderly development, one toward which we may exert effort and influence in the full assurance that it will be actually fulfilled.

If we would make Hometown more livable, we must have before us a picture of its possibilities and then vigorously promote the accomplishment of that picture. To do so will entail interest, courage, cooperation and no end of effort. To promote the accomplishment of the picture will be to set up an improved home environment for innumerable fellow citizens now and during many years to come.

A FIRE HOUSE IN PASADENA, CALIF.

No residence district need be apologetic for such an addition

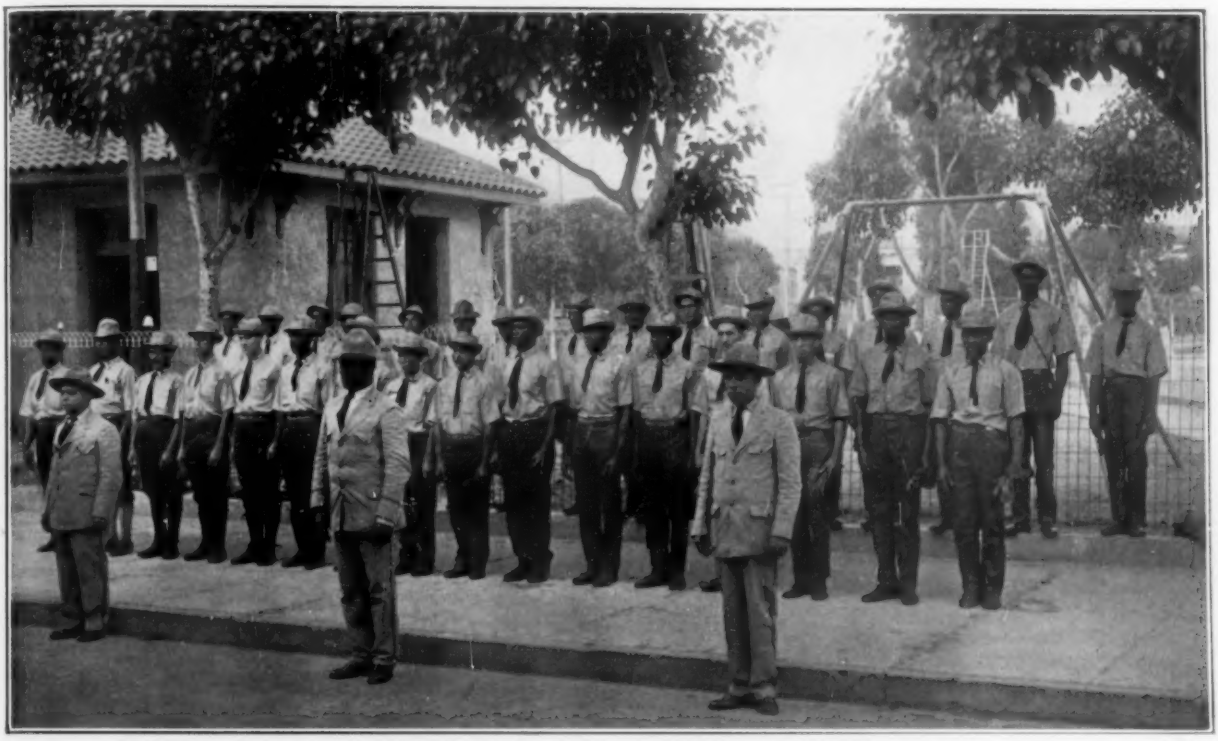
WHERE BLIGHT BEGINS IN RESIDENCE SECTIONS

These two views are of neighborhoods in Cleveland, Ohio, not zoned for exclusive residence use. The grocery store in the one and the apartment house in the other are inevitable consequences. The general effect is strikingly in contrast with that of similar neighborhoods in other parts of the city that are adequately protected

Street Sanitation in Havana

By LIEUT. BERNARDO WOLF
Superintendent, Division of Street Sanitation and Cleaning, Department of Public Works, Havana, Cuba

DURING the Spanish régime the cleaning of the streets of Havana, Cuba, was in charge of the municipal government, which entrusted this important service to a contractor. After the Spanish War, when the United States Government took temporary charge of the island of Cuba, it was considered that the street-cleaning service of Havana should be in charge of the Department of Engineers. The government of Cuba began in 1899 to render this service, which, since then, has had many and great modifications until the present system was developed, which is considered highly efficient, but which is, however, subjected to constant supervision in order to improve it in any possible way. The service is in charge of the Secretary of Public Works.



A SECTION OF THE HAVANA STREET-CLEANING FORCE

Financing

The money appropriated for the Department of Street Sanitation is included in the National General Budget and for the current year is distributed as follows: Administrative and clerical personnel, $41,640; cleaning material (brooms, etc.), $12,000; dumping-place repairs, $5,000; office supplies, $5,000; tugboat expenses, $10,000; garage-building repairs, $3,000; gasoline, $92,000; tires, oil, grease, etc., $25,000; materials, services and salaries, $1,105,080; total, $1,298,720.

It is interesting to note that any surplus remaining at the end of a fiscal year is used for the improvement of equipment and purchasing of materials.

Division of the Service

In order to insure a proper distribution of the work, the city is divided into two zones, the first of which has five districts with from two to six divisions in each district. The second zone has four districts, with three or four divisions in each district. When the limits of the various divisions and districts are being determined, the quantity of garbage to be collected, and the importance of the avenues and streets included in the divisions and districts are given proper consideration. In this manner, a uniform distribution of the work has been secured, so that practically every truck renders the same amount of work in the same period of time.

Areas of Districts

Although the city of Havana has an area of 111,090,000 square meters, only an area of 37,587,250 square meters is densely populated. The areas of the nine districts and the quantity of garbage collected daily in each are:

District	Area	Quantity	District	Area	Quantity
1st	1,303,750 s. m.	50 tons	6th	2,707,510 s. m.	30 tons
2nd	1,507,500 "	50 "	7th	193,500 "	40 "
3rd	2,157,500 "	60 "	8th	10,451,250 "	10 "
4th	2,253,250 "	50 "	9th	6,198,750 "	10 "
5th	10,814,250 "	55 "			
			Total	37,587,250 "	360 "

The weights shown are approximate, as they do not include street sweepings or garbage sent directly to the disposal point by private parties.

Personnel and Salaries

The following table shows the number of people employed in each of the departments of work, with the daily expense for monthly salaries and salaries by the day:

	No.	Daily Monthly Salaries	Expense Salaries by the Day
Office personnel	62	$138.88	$52.25
Zone heads	2	10.50	.....
District heads	10	.....	32.50
Division heads	32	.....	88.00
Pickers' division heads	15	16.23	24.75
Drivers	73	.....	255.30
Garbage collectors	77	.....	221.76
Other garbage-collecting personnel	245	.....	673.75
Sweeping shovelers	50	.....	137.50
Sweepers	92	.....	207.00
Pickers	341	.....	734.65
Dumping-place personnel	54	11.94	132.96
Harbor cleaning personnel	16	2.78	31.50
Garage personnel	57	19.58	118.98
Flushing and watering personnel	23	6.67	63.50
Department police on duty	8	16.64	.....
Totals	1,157	$223.22	$2,774.60

Collection Equipment

39 Mack trucks with 18-cubic-meter capacity special bodies for garbage collecting
24 Ford trucks with 3-cubic-meter capacity bodies specially designed for refuse collecting
12 Mack 1,800-gallon flushers
2 Mack trucks with specially designed sanitary bodies for collecting food refuse
5 Ford touring cars for the department officers
8 motorcycles with side cars for district heads
1 Ford truck for emergencies
1 Fordson tractor for emergencies

Garbage Collection

The collecting of the garbage is done every day throughout the city from 6:30 in the morning to 12 noon, except in the first district or commercial zone, where it is done between 6 and 10 at night.

All trucks are equipped with a gong which warns the householders of the approach of the truck. The householders are forbidden to place their trash cans out until the gong is heard, and they are required to deliver the cans into the hands of the truck attendant and wait at the doors of their houses until the cans have been emptied and returned to them. By this method, cans do not have to be left out on the streets.

In addition to the driver, each truck has a force of eight men whose work is distributed as follows: two men inside the truck emptying the cans and piling up the garbage; two men standing on the platform of the truck picking up the cans from the collectors and passing them to the stevedores and back to the collectors; four men walking alongside the truck, two on each side, collecting the cans from the householders and delivering them to the men on the platforms, receiving the emptied cans and returning them to the householders. The service is well regulated and, as it works on schedule, each truck always passes the same house at approximately the same time on collection days, making it easier for the householders.

TYPE OF TRUCK USED IN HAVANA FOR COLLECTING HOTEL GARBAGE

A set of the regulations relating to street cleaning and garbage collection has been printed and distributed generally among the householders. The duties and rights of the collecting personnel have been regulated, and a copy of the Department regulations has been given to each employee.

HAVANA UTILIZES MOTORCYCLES FOR STREET-CLEANING INSPECTION

In order to stimulate employees to faithfully perform their duties, several prizes have been instituted, the most important being one of $25 given by the Honorable Secretary of Public Works, Dr. Carlos Miguel de Cespedes, which is awarded monthly to the district chief that has his division in best order.

Street Cleaning

All the streets of the city are cleaned daily, the method of doing the work depending upon the importance of the thoroughfare. The streets having the heavier traffic are cleaned by means of pickers or white wings who work eight hours a day and cover a section of from eight to twenty blocks. The streets not having such heavy traffic and those of the suburbs are cleaned by sweeping-gangs covering a given zone.

A total of approximately 35 tons of refuse is collected by these gangs from the street daily, divided by districts as follows: 1st and 3rd, 4 tons each; 2nd, 7th and 8th, 3 tons each; 4th, 5th and 6th, 6 tons each; 9th, refuse included in garbage collected.

Street Flushing

Once the streets have been swept, they are washed by means of the flushers owned by the Department and are

left remarkably clean, as the flushers wash away all the dirt which the sweepers are not able to scour off the pavements. The flushers are also used with very good results for the watering of gardens in parks and boulevards.

Disposal of Garbage and Refuse

The system employed by the city of Havana for the disposal of the garbage collected is quite efficient and thoroughly novel. The Gulf Stream passes Cuba within six miles of Havana. Into this handy receptacle all garbage is dumped without being thrown back on the shore, except on a few occasions when, on account of a rough sea, a small quantity of wood or other floating refuse has been noted and collected.

The cost of disposal is very reasonable, the approximate charge being about 45 cents per ton, not including interest on the amortization of the cost of the equipment. For this service, the Department has one ocean-going tugboat and seven automatic unloading, 300-ton capacity lighters.

The automatic unloading system, which was the idea of one of the engineers of the Department, has great advantages, not only because one man is required to handle it, but also because the lighters are ready for further use in a few minutes. They are 105 feet long, 26 feet wide and 7 feet, 7 inches deep, being divided longitudinally, forming two large tanks which are connected by means of a valve. At one of the ends of the lighters there are four valves, two to each tank, placed level with the bottom of the tanks. While the lighter is unloaded, these valves remain above water, but are below water-level when the lighter is loaded. Once the lighter has reached the point where the garbage is to be dumped, the valves corresponding to one of the tanks are opened in order to admit the water, causing the lighter to tip. When it has reached an angle of 30 to 45 degrees, all of the loaded garbage slides down into the sea. Then the communicating valve between the two tanks is opened and the water distributed evenly between them, making it possible for the lighter to regain an even keel. After this, the four valves at the end of the lighter are opened, and as the load has been discharged, the valves are now above water, and the contents of the tanks are expelled by gravity, the whole operation requiring about 20 minutes.

General Notes on Costs and Quantities

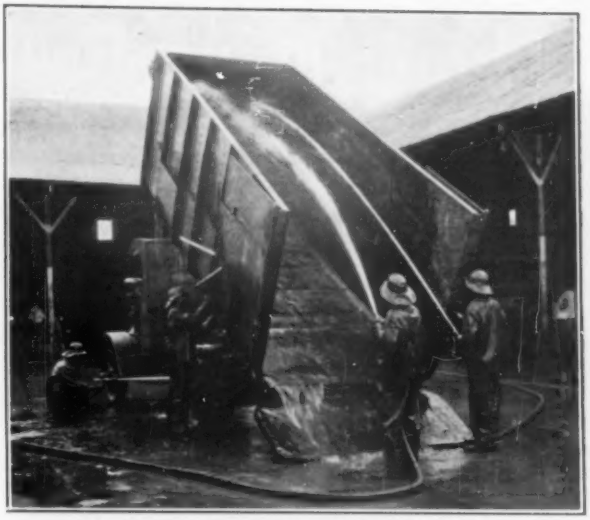
The quantities of garbage disposed of at the dumping place have always been estimated on a basis of one ton for every three cubic meters, and for long periods the garbage was weighed to observe any variations which might occur. Recently, the whole of the garbage was weighed for 105 consecutive days and thus the average has been accurately determined.

QUANTITIES AND COSTS FOR GARBAGE AND REFUSE COLLECTED

Collected in 105 days:		Daily average:		Cost to operate (average per ton):	
Garbage	65,105.3 tons	Garbage collected	420.0 tons	Collection of garbage	$3.18
Sweepings	4,663.6 "	Sweepings	44.4 "	Sweeping	3.89
Private	7,717.3 "	Private	73.5 "	Disposal	0.454
	77,486.2 tons				

Total for all services, $7.12 per ton.

While the cost of collection is quite high compared with that of other cities, the quality of the service that is rendered justifies the high cost. The Department is, however, studying means of reducing the cost both in the collection and disposal of garbage and in the cleaning and sanitation of the city.



EVEN IN HAVANA, COLLECTION TRUCKS DO NOT CLEAN THEMSELVES

PERSONNEL OF THE DEPARTMENT OF SANITATION

Service	Number of Employees	Per Cent of Total	Daily Cost for Service	Annual Cost
Garbage	434	37.5	$1,334.30	.....
Street sweeping	561	48.5	1,725.70	.....
Dumping place	74	6.4	227.72	.....
Flushing	27	5.3	81.84	.....
Garage	61	5.3	188.58	.....
	1,157	100.0	$3,558.14	$1,298,720.00

MISSISSIPPI PIONEERS IN ZONING STATE HIGHWAYS

THE state of Mississippi has pioneered in the adoption of building setbacks on all state highways. This action in effect makes impossible future roadside billboards, hot-dog stands and gas stations. Under it, no structure may be erected within 50 feet of the center of a primary highway, or within 40 feet of the center of a secondary highway. The primary and secondary systems as now outlined are to have a total of 6,000 miles. There are approximately 60,000 miles of all types of roads in the state.

"Surely then," says the Commission in announcing the new regulation, " if the state highways are to constitute only 10 per cent of all roads, it is vital that the necessary provision be made for future growth on this small percentage. In a strict sense of the word, the right-of-way is the only permanent feature of the road. It therefore seems mandatory that an ample reservation of land be made for the future of state highways . . . . and it would appear that 100 feet for primary and 80 feet for secondary routes will be a very meager provision.

"The Legislature did not contemplate the taking by the State Highway Department of any person's land without fair compensation, nor does the ordinance adopted by the Commission contemplate any such action. It is intended to operate in exactly the same manner that a zoning or fire ordinance operates in our cities and towns. It is a just and proper municipal ordinance that prohibits the construction by the owner of land of a frame structure within a congested commercial area. Therefore, it would appear logical and just for another branch of the state government to have the authority to say to the landowner that it is inimical and hazardous to the traveling public for filling stations, garages, restaurants, advertising signs, etc., to be built nearer than 50 feet of the center of a primary highway, and that it will be contrary to law for such structures to be erected.

"The regulation does not involve the removal by the owner of any structure outside the present right-of-way that may have existed prior to the adoption of the ordinance. In these cases if removal becomes necessary, the state will most certainly be required to tender adequate compensation."

Infiltration of Ground Water into Sewers

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THE discussion* which prompted this article was primarily concerned with the permissibility of connecting cellar drains to sanitary sewers, and if this were permitted, what provision should be made in the capacity of the sanitary sewer system. In general, the practice is to be discouraged, but in a few instances we have found that to refuse to relieve flooded cellars would work a serious hardship on the property owners in limited areas in the communities for which we were designing sewers.

Consequently a study was made of the general subject of infiltration in connection with sewer flooding in order to ascertain what risk of overloading the sewers was being run in case the drainage of cellars was permitted, what allowance should be made in design, and what restrictions imposed.

In connection with combined systems of sewerage, it was taken as a matter of course that cellar drains would be connected to the sewers, and later when separate systems for sanitary sewage and storm drainage began to be the accepted procedure, it was expected that cellar drains and the down spouts from roof areas would be connected to the storm-water sewers.

In many of the smaller communities storm drainage is limited and the sewers are often not favorably placed or are at insufficient depths to provide proper connection for cellar drains. In general, the connection of cellar floor drains to sanitary sewers is to be discouraged, but when, as it sometimes happens, the credit of a community is exhausted in the construction of its sanitary-sewer system and certain sections are left with cellars which are flooded at times of heavy rains, the engineers may reasonably be expected to state why it is impossible for cellars to be drained into the sanitary sewers, or under what conditions such connections may be permitted.

How Much Infiltration?

The first question that is raised is with regard to the quantity of water to be taken care of, and this brings up the entire subject of the percolation and infiltration of water through the soil, and the question of infiltration into sewers in general.

For the purposes of this article, infiltration may be defined as the natural and unavoidable entry of the ground water into a sewer through broken pipe, defective joints, and poor masonry.

The difficulty, so far as the records of flows in actual sewers are concerned, is to separate the true infiltration from the normal flow of domestic sewage and trade wastes, and from the surface and ground water entering through unlawful connections.

As guides to what may be expected, we have turned to records along the following lines:

A. The yield of springs
B. Land drainage experiments with under-drains
C. The percolation flow of streams
D. The gagings of sewers, and the experiments and opinions of other observers

* Before the New York Sewage Works Association, May, 1930.

The Yield of Springs

The flow of springs has been carefully studied both in Switzerland and in Germany. In Switzerland it has been found that the normal minimum flow to be expected was:

154 gal. per acre per day from fine-grained sandstone, as the molasse
600 to 900 gal. per acre per day from moraines
1,200 to 1,500 gal. per acre per day from gravelly soil of valleys

In Germany, similar tests show:

Minimum flow.....	154 to 924 gal. per acre per day
Average	462 to 1,232 gal. per acre per day
Maximum	770 to 4,620 gal. per acre per day

Land Drainage with Underdrains

With regard to the infiltration captured by land tile, J. L. Parsons in "Land Drainage" in 1915 states that for the smaller watersheds and average soil, tile systems designed to remove ¼-inch of depth in 24 hours have from experiments and experience been found generally satisfactory. The variation would be from ⅛-inch to ¾-inch in 24 hours.

In Haarlem Lake in Holland, with an area of 43,700 acres, the drains are kept free by pumps which usually operate 94 days of 24 hours each per year. The average rainfall is 32 inches with a maximum of 40.16 inches and minimum of 27.6 inches. When all the pumps are working, they remove from ¼-inch to ⅜-inch in depth in 24 hours.

The government of Silesia, Germany, and the French government recommend drain capacity of 0.22-inch for level land, and 0.29-inch for broken land.

In southern Germany, in the course of experiments in draining moorland, discharges from the tile drains have been noted at a rate of ½-inch in 24 hours.

Provisions for ¼-inch of depth in 24 hours has been found sufficient in the fens of England.

Illinois and Iowa experiments by the United States Department of Agriculture (Hidinger, 1908) show that in Illinois a drain capacity sufficient to remove 1/6-inch in 24 hours is sufficient, and in Iowa 1/5-inch to 1/6-inch is sufficient.

Pickels, in "Drainage and Flood Control Engineering," 1925, states that the maximum rate of discharge from a tile drainage system generally occurs from 5 to 10 hours after the maximum intensity of precipitation when the water table is the highest. This of course depends upon the length and rate of precipitation. Increasing the depth of the drains tends to increase the rate of run-off.

During the summer of 1914, the Iowa Experiment Station conducted a series of run-off investigations in southern Iowa. The soil was originally rather close but it had become more open following several years of underdrainage.

"From early spring until the latter part of May the soil was very dry, though it had been wet when the crop, oats, was planted. The rainfall during June was as follows: June 10, 0.50-inch; June 13, 2.12-inch; June 22, 0.50-inch; July 6, 1.25-inch; July 12, 2.06-inch; and July 16, 1.0-inch.

Each of these rains was a heavy downpour lasting but a short time. The water reached the surface so rapidly that a very large proportion of it passed away as surface run-off. So small a portion of this water entered the soil that at no time during June or July was there any flow in the outlet mains of these systems. If the rate of precipitation in these storms had been slow, it is very possible that after the rains of July 12, or 16, the outlet main would have been flowing full."

Pickels gives the following general values as an aid in determining the capacity to be provided for in under-drains:

¼-inch for areas with an annual rainfall under 30 inches, such as Minnesota, South Dakota, Nebraska, and Kansas

5/16-inch to ⅜-inch for areas with annual rainfall between 30 inches and 40 inches; such as Iowa, Wisconsin, Michigan, Illinois, Indiana, and Mississippi

½-inch for areas having an annual rainfall between 40 inches and 50 inches, such as Arkansas, northern Mississippi, Tennessee, Alabama, Georgia and the Carolinas, and

¾-inch for areas having over 50 inches of annual precipitation, such as Louisiana, southern Mississippi, and Florida

In certain English land drainage experiments, J. Bailey Denton and Charnuck found maximum rates of infiltration of 1,710 gallons per acre per day at Hinxworth in January, and 2,582 gallons per acre per day at Holmfield, respectively.

French authorities like Herve-Mangon and Delacroix state that under-drain systems should have capacity to remove 0.24-inch of water per day, or 6,517 gal. per acre per day.

The Percolation Flow of Streams

With regard to the percolation flow of streams, the Miami Conservancy District (Ohio), has made certain investigations with results as follows:

SURFACE FLOW AND PERCOLATION—Miami Valley (Miami Conservancy District)

		Sq. mi.	Precip. at Dayton	Surface Flow Inches	Surface Flow % of Total	Percolation Inches	Percolation % of Total	Total Run-off
Miami at Dayton	1894 1919	2,525	37.1	7.777	65.6	4.08	34.4	11.85
Buck Creek at Springfield	1915-19	163	37.8	4.83	44.3	6.06	55.7	10.89
Mad River at Wright	1915-19	652	37.8	7.34	53.3	6.44	46.7	13.78
Stillwater River at Milton	1915-19	600	37.8	10.70	78.8	2.88	21.2	13.58

Using the largest of these figures, we have a percolation flow of 6.44-inch per year, which amounts to 480 gallons per acre per day.

Among the conclusions reached from experiments by the Miami Conservancy District at Moraine Park, near Dayton, was the following: "The annual surface run-off amounts to ⅛ of the rainfall, and the annual percolation amounts to 1/5 of the rainfall." At Dayton, with a rainfall of 37.8-inches, the percolation would equal 7.56 inches or 565 gallons per acre per day.

Results of Sewer Gagings

In approaching the data from actual sewer gagings, we find that in certain locations excessive flows occur frequently. These flows are probably made up of the following factors in addition to the normal flow of sewage:

1. Ground-water infiltration through defective joints and poor masonry in street sewers, manholes, and house connections
2. Rain water from down spouts and yard drains unlawfully connected to the sanitary sewers, and surface water through perforated manhole covers
3. Blind drains around foundations of buildings
4. Floor drains in cellars

While there are some data available on high flows in sewers, there are not many occasions in which sufficient information is given to enable one to eliminate the other factors aside from infiltration.

In New Orleans, conditions were favorable for obtaining such information, and in reporting on the sewerage for that city in 1903 Hering & Fuller used a figure of 0.003-cubic feet per second per acre for ground-water infiltration. This was based on actual experiments in that city, and is equivalent to 1,950 gallons per acre per 24 hours. The average density of population was 32 per acre, and the infiltration amounted to 61 gallons per capita per day. The mean rainfall at New Orleans is about 56 inches per year. One thousand nine hundred and fifty gallons per acre per day is 26.2 inches in depth over the area in one year or 1/14-inch in depth over the area in 24 hours.

Metcalf & Eddy, American Sewerage Practice, Volume I, under "Leakage of Ground Water into Sewers," enumerate 27 sections of sewers of which

2 had an infiltration of less than 10,000 gal. per mile of sewer
17 had an infiltration of 20,000 to 50,000
4 had an infiltration of 51,000 to 100,000
4 had an infiltration of over 100,000 gal.

In 1903, Ernest Adam, Engineer of the Department of Streets, Newark, N. J., gave the following data with regard to the sewers of Newark, stating at the same time that many of the old brick sewers were made without mortar joints at the bottom:

Population, 268,500
Total length of sewers, 198.7 miles
Total acres, 14,976; 10,679 acres dry land, 4,297 tidal meadows, and water
48,000,000 gal. per day of sewage
25,000,000 gal. per day of water
Therefore, 23,000,000 gal. infiltration = 85.7 gal. per capita; 115,752 gal. per mile; 2,152 gal. per acre

In his report on the Joint Sewer (N. J., 1922), Alexander Potter proposed to use 185 gallons per capita per day for domestic and commercial sewage and trade waste, and in addition, a per-capita infiltration figure varying inversely as the density of population ranging from approximately 600 gallons per acre per day for the most sparsely settled districts, to some 1,950 gallons per acre per day for population densities approaching 50 per acre.

In 1929 the writer made an investigation of the high rates of flow in the sanitary sewer system of the city of Summit, N. J.

The sewerage system of Summit is divided into two areas, the sewage from one section requiring to be pumped into the Joint Sewer, while that from the other area flows into the Joint Sewer by gravity. The water consumption is approximately 100 gallons per capita. There is practically no industrial waste. The sewage from the pumping area is measured by a venturi meter installed in the discharge line from the pumping station.

The data from these investigations are given on p. 132.

To summarize the foregoing data, we find:

A. The yield of springs
   Average 450 to 1,250 gal. per acre per day. Maximum 4,600 gal. per acre per day.

B. Land drainage
   The figure most frequently recommended for design of

capacity for underdrains is ¼-inch per 24 hours, which is equal to 6,790 gal. per acre per day.

C. Average figures which relate more closely to the quantity of water to be purified or treated than to peak loads governing capacity, are indicated by the percolation flow of streams, and the conclusions of the Miami Conservancy District give 500 to 600 gallons per acre per day as the percolation which might be expected in a district with 30 to 40 inches of rainfall annually.

D. In the case of actual experiments on sewers
The New Orleans experiments gave an infiltration of 1,950 gal. per acre per day.
The Newark sewer records give 2,152 gal. per acre per day, but state that the sewers were old and in bad condition.

The writer's investigations at Summit, N. J., shown in the table, indicate 500 gallons per acre per day as representing the infiltration during the maximum month, and from 1,700 to 1,900 gallons per acre per day as the maximum rate of infiltration during the time of high water table following a prolonged rainy period. The sewers are built strictly on the separate system. This is equivalent to 69,000 to 74,000 gallons per day per mile.

The majority of sewers enumerated by Metcalf & Eddy indicate an infiltration of less than 50,000 gallons per mile.

The Summit gagings show further that during storms the infiltration and surface water amount to as much as 10,150 gallons per acre per day, indicating that the improper entry of surface water is probably the greatest factor in surcharging sewers.

Rate of Infiltration

The foregoing figures indicate that the maximum rate of true infiltration into sewers depends upon the opportunity given to the ground water for entry, and is commonly several times less than the rate of infiltration of ground water into under-drains which are designed to make the infiltration as easy as possible.

With increasing density of population, these opportunities for the entrance of ground water are increased in number through the installation of a greater length of sewers and house connections per acre, but this is partially offset by the construction of storm-water drains and the impervious surfaces of roofs and pavements, which keep a portion of the rain water from being deposited upon the ground in the vicinity of the sewers.

If conditions are such that a location which is subject to the misfortune of wet cellars cannot be relieved by the construction of storm-water sewers to which roof leaders and cellar drains can be connected, and it is desirable to relieve the situation through the sanitary sewer system, the quantity of water should be reduced as far as possible by:

a. Making the cellar tight as possible
b. Conducting all roof water to a point well away from the building
c. No blind drains should be connected to sanitary sewers

Where cellar drains are installed, they should be well trapped to prevent the entrance of sewer gas into the cellars.

When these precautions have been taken, the number of houses having wet cellars should be estimated. It will be found that the removal of rain and surface water from the vicinity of the buildings will frequently diminish greatly the quantity of water entering the cellar.

The provision to be made for each house so drained will be governed by local conditions but the limits are suggested by the figures given above.

Unrestricted Cellar Drainage Undesirable

The writer does not believe that it is desirable to allow unrestricted cellar drainage into sanitary sewers, but it is equally undesirable to fail to give relief to conditions which cause injury to health and property, if that can be done without prejudice to the interests of other taxpayers.

Permission should be given with the express right of inspection and revocation, if experience shows it being abused or infringing on the rights of other taxpayers to proper sewerage.

In many states it is now possible to charge a rental for sewer facilities and a rental could be fixed for this service, such that it would not be requested except where any other solution of the problem is out of the question.

While providing this service may bring difficulties in administration, the problem is one that is being raised with more frequency and insistence. With changed methods of heating, cellars are becoming a part of the living quarters of the house, and objections to occasional flooding are much more more important than in the past.

Bibliography:
Water Power Engineering—Barrows
Engineering and Land Drainage—Elliott
Drainage and Flood Control Engineering—Pickels
American Sewerage Practice—Metcalf & Eddy
Infiltration of Ground Water into Sewers—Discussion by Emil Kuichling, Transactions, American Society of Civil Engineers, Vol. LXXVI.

SUMMIT, NEW JERSEY, INVESTIGATION OF HIGH RATES OF FLOW IN SANITARY SEWERS

	Population	Area Actually Sewered —Acres	Miles of Sewers	Dry Weather Flow 3 Months Average Gallons per Day	Average for Year 1928 Gals. per Day	Max. Rate of Flow and Duration High Water Table but Not During Storm April 29, 1929	Max. Rate of Flow During Rain Storm and Duration	Max. Rate of Flow During Rain Storm Peak	Max. Month	Max. Rate of Flow during Storm from Area of 166 Acres Pop. 1144, with 3.87 Mi. of Sewer. Peak in M.G.D.
Pumping Area	6140	1156	28.3	531,000	759,000	2.57 m.g.d. for 1½h.	4.2 m.g.d. for 4h.	4.77 m.g.d.	1.196 m.g.d.	1.8 m.g.d.
Density	5.3 per Ac.									
Per-Capita Gals.				87 g.p.d.		419 g.p.d.	685 g.p.d.	777 g.p.d.	195 g.p.d.	1575 g.p.d.
Infiltration and surface water after deducting 100 Gals. per capita for normal flow						1.96 m.g.d.	3.59 m.g.d.	4.16 m.g.d.	.58 m.g.d.	1.685 m.g.d.
Per Capita						320 g.p.d.	585 g.p.d.	677 g.p.d.	95 g.p.d.	1470 g.p.d.
Per Acres						1700 g.p.d.	3105 g.p.d.	3600 g.p.d.	500 g.p.d.	10,150 g.p.d.
Per Mile						69,300 g.p.d.	126,000 g.p.d.	147,000 g.p.d.	20,500 g.p.d.	436,000 g.p.d.
Gravity Area	7305	749	19.1			2.15 m.g.d. for 2¼ h.				
Density	9.8 per Ac.									
Per-Capita Gals.						2.87 g.p.d.				
Infiltration and surface water after deducting 100 gals. per cap. for for normal flow						1.42 m.g.d.				
Per Capita						193 g.p.d.				
Per Acres						1900 p.g.d.				
Per Mile						74,300 g.p.d.				

A 140-Ton Mixed-Refuse Incinerator for Camden, N. J.

By FRANK B. HANNA
Director of Streets and Public Works

EXTERIOR OF THE CAMDEN INCINERATOR, SHOWING ITS PROXIMITY TO THE BUSINESS DISTRICT

THE city of Camden, N. J., completed early in 1930 a modern Decarie incinerator designed for 24-hour operation with a rated capacity of 140 tons of mixed refuse per day, which has demonstrated its ability to exceed the contract guarantees. This plant is centrally located, as any modern incinerator may be, thereby reducing the major cost of refuse disposal, which is the transporting of the refuse to the point of final disposal. The plant is built adjacent to the city stables and only a few squares from the City Hall and the leading hotel.

The loaded trucks, after passing over scales provided at the entrance of the property, approach the building on a low dirt-fill driveway and dump their loads into a reinforced concrete storage bin that extends along one side of the building. With this arrangement no ground space is necessary for an expensive overhead ramp and the trucks can be emptied without delay at any time of day or night.

This bin has a capacity of receiving 390 cubic yards of refuse and it is provided with a depressed gutter drain for its entire length so that it may be washed and sterilized with hot water, which is available in abundance.

This gutter leads to a sump located outside of the bin, where solid materials can be removed before the water used for washing is discharged into the sewer.

A uniform feed is assured the furnaces from the bin by means of an electrically operated 3-ton traveling crane equipped with a 1½-yard grab bucket which deposits the refuse in steel feed hoppers of large area to prevent spillage on the floor.

The Furnaces

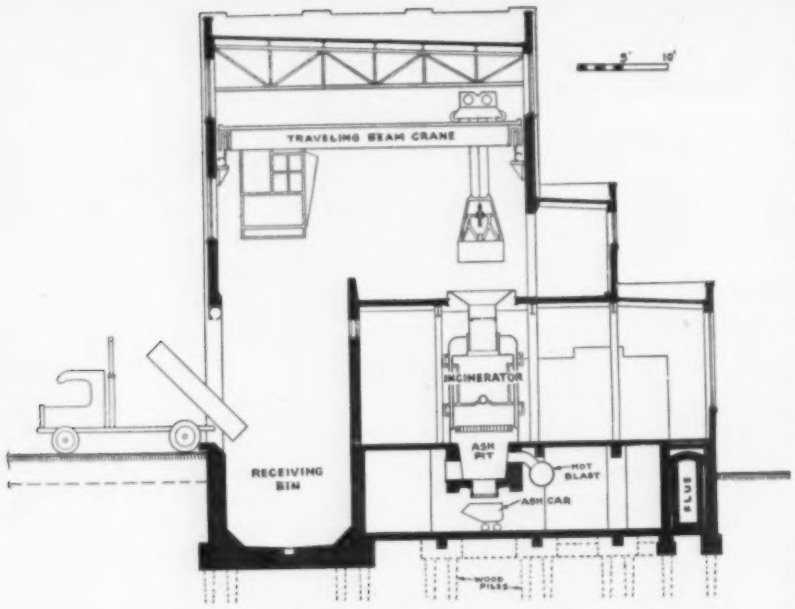
On the first or stoking floor, which is 4.5 feet above grade, are located the two 70-ton furnaces of the Decarie heavy-duty, steel water-jacketed type. Each furnace has an individual firebrick-lined, steel-encased gas-combustion chamber, refractory-tile forced-draft air preheater and steam-driven forced-draft fan.

Each furnace receives into its suspended water-cooled basket grate, through the 3- by 4-foot charging opening in the top and the automatic self-closing doors of the charging hopper, 8 cubic yards of refuse at one time without affecting the fire on the lower dumping grate beneath the basket. The furnaces embody the distinctive principle of this special type, which allows unrestricted upward combustion of the refuse, the wetter material being dried out in the suspended water-cooled basket grate before dropping to the lower grate, where final burning takes place.

The walls of these furnaces are made of steel water-jacketed construction. The lower grates of the furnaces are of heavy cast iron of the cantilever full-dumping type operated by ratchets and worms on the outside of the ash-pit fronts. When cleaning of the fires is necessary, it can be accomplished in a few minutes with a small amount of effort on the part of the firemen. The grates are dumped over the whole area inside the furnace, discharging the ash and clinker into the firebrick-lined pits beneath each furnace. As soon as the grates have been brought back to position dried refuse is stoked down from the basket grate above, where burning has been going on all the time. Operation continues practically without interruption. The cleaning of fires causes no heat or dust on the furnace floor and the grates can be dumped without opening the stoking doors of the furnace.

Disposal of Clinker and Ashes

The hot clinker and ashes may lie in the ash-pits with the forced draft passing over them to cool them, and are then discharged through duplex self-locking gates into the ash-cars beneath the pits, the dust being drawn back



A CROSS-SECTION OF THE INCINERATOR, DRAWN TO SCALE

into the pits by the draft. The loaded ash-cars are then run over a narrow-gage track to the electric platform hoist which raises them up for discharging their loads by gravity into trucks to be taken away for filling low ground.

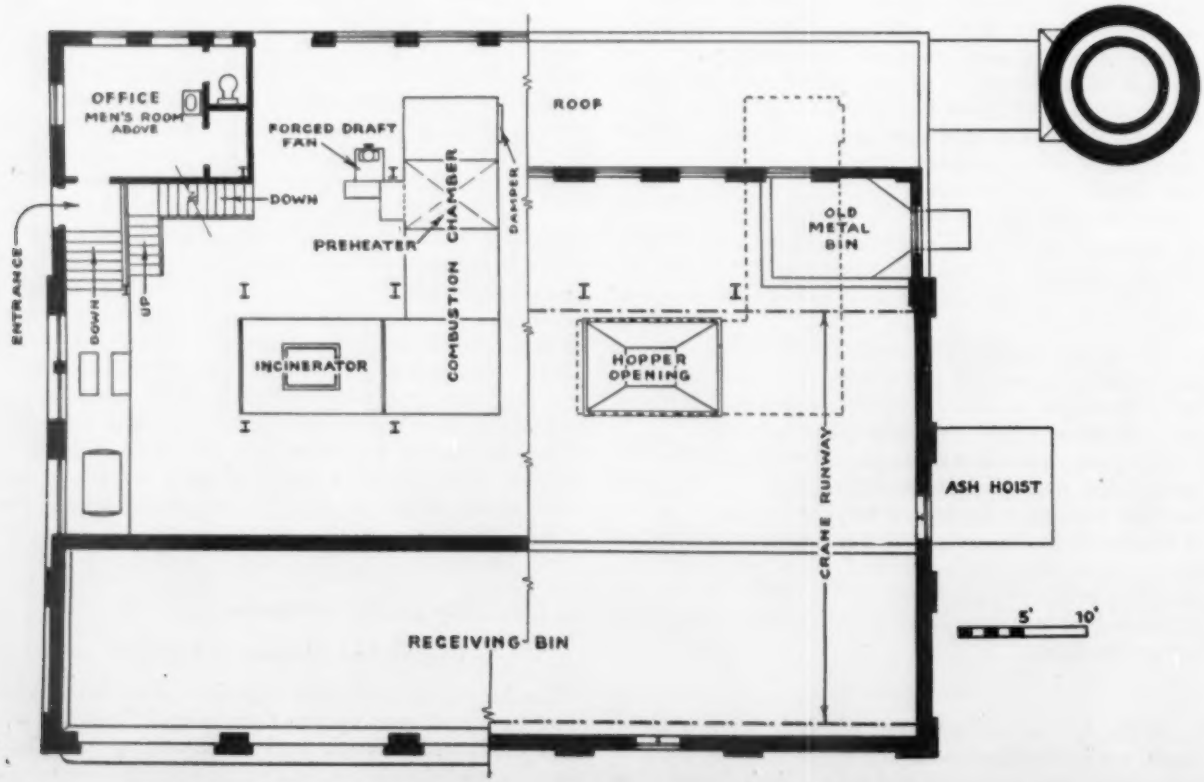
The ceiling of the ash tunnel is 9 feet high and windows are provided. The air supply for the forced-draft fans is taken from the ceiling of the tunnel and working conditions for the men are exceptionally good. From the furnaces the flames and gases of combustion pass into the combustion chamber provided for each unit, where high temperatures are maintained and the combustion completed.

The firebrick work of these chambers is incased in a steel casing 3/16-inch thick, which has ample steel channel buck-stays and stiffening angles riveted on the outside. These chambers are of sufficient size to allow the gases to expand and reduce their velocity, and necessary baffle walls and settling pits are provided to obtain destruction of odors and the collection of dust particles. These pits are provided with cleanout doors in the ash tunnel so that the dust may be removed directly into the ash-cars.

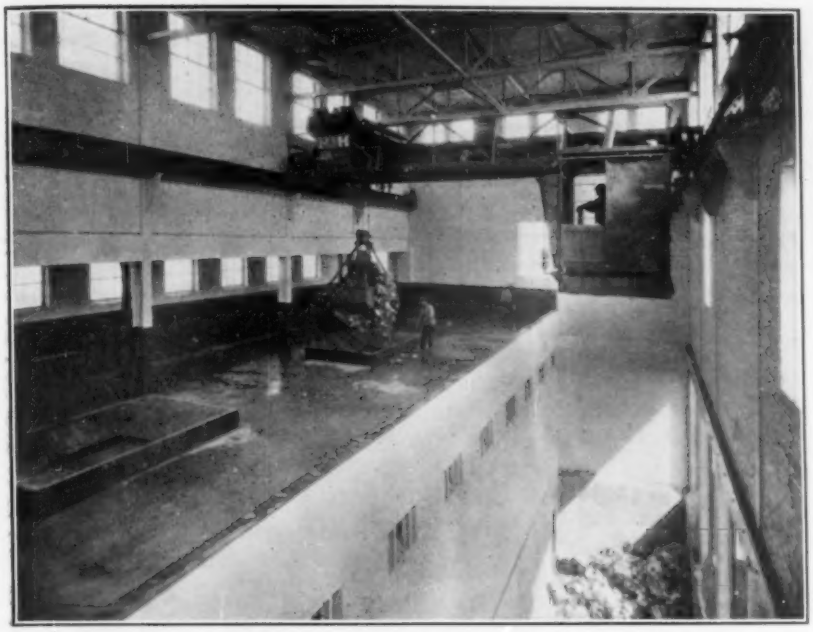
The Forced-Draft Air Supply

In the rear portion of these chambers is a pre-heater or regenerator for heating the forced-draft supply, thereby returning to the primary furnace a large portion of the waste heat that would otherwise pass up the chimney. The preheater is of unique design, allowing gases with a temperature of as high as 2,500° F. to pass through without damage. The preheater is built of special patented interlocking refractory fire tile with the hot gases passing through horizontal passages and the air from the forced-draft fan entering at the top and passing down through vertical passages to the ducts beneath that lead to the ash-pits. The air is heated in this way to a temperature of from 350° to 500° F.

To the rear of the preheater is located a direct pass to



PLAN OF THE OPERATING AND CHARGING FLOORS OF THE INCINERATOR



INTERIOR OF THE CAMDEN INCINERATOR, SHOWING A CORNER OF THE DUMPING-PIT AND THE LOADING CRANE WITH GRAB-BUCKET LOADING ONE OF THE FURNACES

the breeching provided with a guillotine-type damper.

The forced-draft fans are driven by steam engines and the furnaces supply much more than enough steam power to drive these fans. This excess steam power has not as yet been utilized.

The breeching leading the gases to the chimney is constructed largely beneath the floor of reinforced concrete and lined with 9 inches of firebrick to the inside of the chimney. The chimney is of red radial brick construction 125 feet high, lined the full height with an independent, self-supporting firebrick lining.

Housing the Plant

The building housing this equipment is of attractive appearance, of concrete, brick and steel-frame construction, having two floors and basement. An office and a men's room with all facilities such as steam heat, hot and cold water, toilets, showers, lockers, etc., are provided.

The interior of the building above the basement is painted and the building is exceptionally well lighted and ventilated on four sides. Many hose connections are located throughout the building so the plant may easily be kept clean.

At the entrance to the property there is a platform motor-truck scale on concrete foundations with a brick-and-steel scale house for weighing the refuse received for destruction.

The entire plant was furnished under one contract with the Decarie Incinerator Corporation, New York.

Extracts from Specifications and Guarantees

The following paragraphs are quoted from the specifications covering the project as to guarantees demanded and those made by the contractor:

Capacity.—The plant shall have a normal rated capacity of destroying and burning to a clean ash or clinker not less than 140 tons (2,000 lbs.) per 24 hours of garbage and rubbish consisting of approximately 65 per cent of garbage and 35 per cent of combustible rubbish, by weight.

Statements.—Each bidder shall submit with his bid statements giving the following information:

(a) A statement as to the amount and kind of power required to operate the furnaces at their rated capacity including all auxiliary equipment which the bidder proposes to install, such as fans, ash-hoists, crane, etc.

(b) A statement of the man-hours of labor required for each ton of refuse incinerated on the basis of operating three 8-hour shifts per day, 6 days per week. This to include the necessary Sunday crew for cleaning flues, etc., and it shall include supervision, weighman, fireman, cranemen, charging men, ash men, and all other plant labor. A sheet shall be submitted with the bid showing the proposed distribution of this crew throughout the plant.

(c) A statement of the average number of pounds of refuse to be burned per square foot per hour on each square foot of open cast iron grate on which final consumption takes place in the proposed furnace when operating at the rated capacity.

(d) A statement as to the amount of fuel (coal or its equivalent) required per ton of refuse incinerated, such as above specified.

(e) A statement as to the number of cubic yards of mixed refuse that can be charged into each furnace at one time without interfering with or tending to smother the fire on the open cast iron grate where final consumption takes place.

(f) A statement as to the number of square feet of open cast iron grate on which final consumption of the refuse takes place, not including any portion of a drying hearth or grate.

(g) A statement as to the size of the openings of the charging holes.

(h) A statement as to the make of chimney to be furnished and the years of experience of the chimney builders.

Guarantees.—Each bidder shall agree to make the following guarantees when the plant is installed complete in accordance with approved detailed plans and specifications:

(a) To protect the city against all litigation which might be brought for the use of any device or patented article included in the equipment.

(b) That the furnaces shall be capable of destroying and burning to a clean ash or clinker not less than 140 tons (2,000 lbs.) of mixed refuse as above described in 24 hours at normal rating.

(c) That the plant with any or all units in normal operation shall cause no nuisance through the escape of obnoxious odors, gases or dust from the chimney or building.

(d) That all refuse except metal and incombustible materials placed in any unit, shall be evaporated and burned to a mineral ash practically free from combustible matter.

(e) That the amount of electric power used per ton of refuse consumed will not exceed the amount stated as called for.

(f) That the number of man-hours of labor required per ton of refuse

EXTERIOR VIEW OF THE DUMPING-PIT OF THE INCINERATOR

incinerated shall not exceed that stated as called for. This to include only labor actually engaged in the operation of the plant.

(g) That the amount of fuel, such as coal or its equivalent, required per ton of refuse incinerated, shall not exceed the amount stated as called for.

(h) That all flues, dust chambers and pits will be so arranged that dust may be withdrawn without requiring the plant to be closed down for over 24 hours.

(i) To replace any metal parts failing because of faulty material or workmanship within a period of one year following date of acceptance of the completed plant by the city.

Guarantees Made by the Contractor

Patent Protection.—1. We guarantee to protect the city against all litigation which might be brought for the use of any device or patented article included in the equipment.

Capacity.—2. We guarantee that the furnaces shall be capable of destroying and burning to a clean ash or clinker not less than 140 tons (2,000 lbs.) of mixed refuse as above described in 24 hours at normal rating.

Odors.—3. We guarantee that the plant with any or all units in normal operation shall cause no nuisance through the escape of obnoxious odors, gases, or dust from the chimney or building.

Clean Ash.—4. We guarantee that all refuse, except metals and incombustible materials, placed in any unit shall be evaporated and burned to a mineral ash practically free from combustible matter.

Electric Power.—5. We guarantee that the amount of electric power to be used per ton of refuse consumed will not exceed 1.5 kilowatt-hours, exclusive of lights.

Labor.—6. We guarantee that the man-hours of labor required for each ton of refuse incinerated on the basis of operating three 8-hour shifts per day, 6 days a week, including supervision, weighman, fireman, cranemen, charging men and ash men and necessary Sunday crew for cleaning flues, etc., will not exceed 1.5 man-hours as shown on attached distribution sheet. This to include only labor actually engaged in the operation of the plant.

Fuel.—7. We guarantee that when burning mixed refuse consisting of 65 per cent of garbage and 35 per cent of rubbish, by weight, as specified, no commercial fuel such as coal or its equivalent will be required for the burning of same.

Cleaning.—8. We guarantee that all flues, dust chambers and pits will be so arranged that dust may be withdrawn without requiring the plant to be closed down for over 24 hours.

Replacements.—9. We guarantee to replace any metal parts failing because of faulty material or workmanship within a period of one year following date of acceptance of the completed plant by the city.

Patched Streets Are Smooth Streets in Asheville, N. C.

Methods Used in Famed Industrial and Resort City in the Mountains of North Carolina

PATCHED streets usually mean bumps, cuss-words and broken springs, but in Asheville the Superintendent of Streets, P. Frady, has seen to it that a system has been developed that gives serviceable patches in all kinds of pavements.

Instead of one large street gang that is likely to be unwieldy, the repairs are made by small gangs of from three to five men who are scattered over the city taking care of different kinds of patches, but always patching the pavement with like material, for that is the first part of the secret of success in patching. In patching an old broken concrete paving, a regular paving mix is used, but if it is necessary to speed up the setting, the amount of cement is doubled. Longitudinal cracks in concrete pavements are immediately poured with asphalt to prevent any water from entering the subgrade and starting disintegration.

Brick pavements are repaired with bricks except in a few cases where a very small failure would be difficult to handle with brick, when an asphalt mix is used.

Repairing Utility Cuts

It is axiomatic that the curse of the street man is the vast number of holes that the various utilities such as water departments, gas, electricity, telephone and others, make in the smooth surfaces of the streets. These are all handled by the Street Department in Asheville. The trench is backfilled with the earth removed, and carefully hand tamped. Mr. Frady does not believe in puddling, as it leaves the trench too unstable unless there is considerable delay for the water to dry out, and this prolongs the inconvenience to traffic. In every case the trench

REPAIRING WITH HOT MIX IN ASHEVILLE, N. C.

1. The Chausse portable plant housed at the city yard to produce the hot mix. 2. A clean cut in the pavement ready for the patch. 3. Spreading the hot mix from the truck, raking and tamping

REPAIRING AN OLD RESURFACING JOB

1. The old surface cut out ready for painting the edges and bottom with hot asphalt. 2. Pouring and brooming the hot asphalt over the bottom. 3. Filling the patch flush with ⅝-inch chats preparatory to penetrating them with hot asphalt and then covering with ⅝-inch chats and hand tamping. 4. An old repair at the left; at the right, the condition of an old 1¼-inch surface which will be removed and patched by the use of chats

is cut back under the surface to solid ground and the patch thickened and carried under the old pavement to strengthen the surface at the weak spot. This is done no matter what type of pavement is being patched.

The Asphalt Plant

There are 145 miles of streets in Asheville that are paved, and a large proportion of these are paved with various types of asphalt surfacing, which because of unstable foundations has cracked in many places and thus needs repair. Various types of patches have been used—bitulithic, Amiesite, and sheet asphalt purchased from the local commercial plant when it is running. The fact that it is too expensive to purchase from the commercial plant unless it is running on a large contract led to the purchase of a Chausse portable plant. While at first it was intended to use this plant as a portable unit, it was decided that it would be better to centralize the location of the plant in the municipal yard next to the municipal garage, then hot-mix batches could be hauled out to the various sections of the city more quickly than the plant itself could be moved. The Street Department does not wait until a street is badly in need of attention before anything is done. Rather, as soon as one or two small places show need of repair, they are attended to. Consequently the streets of Asheville are always comfortable to ride on.

The Chaussee plant is housed in a wooden building about 20 x 35 feet in plan, large enough to care for the plant and also to store considerable sand, two sizes of stone and the limestone dust, as well as a portion of the asphalt, which is shipped in drums from the Standard Oil refinery at Charleston, S. C. The model of plant which is installed at Asheville has only one drum for drying sand, the space back of the drier being designed for the storage of sand as a part of the portable feature of the plant. It is planned to replace the sand bin with a second drier as has been done in some of the later plants to speed up the output of the plant.

Another feature of the Asheville installation is the use of a Littleford asphalt kettle mounted on the hill above the plant, for heating additional asphalt, which is run to the plant by gravity. With the plant as now installed, 15 to 18 tons of hot mix are produced per day.

Placing the Asphalt Patches

The mix used most successfully for patching in Asheville has been two parts fine sand, one part coarse sand, one part ⅝-inch stone and one part limestone dust or

cement. It takes from ten to twelve minutes to dry the damp sand in the one drier of the plant, and about four minutes to mix the 400-pound batch with the asphalt. In order to speed up the handling of the batches by the trucks, a hopper has been built beneath the plant, with a metal lining, where batches may be stored when there are no trucks at the plant; then when the truck arrives at the plant it is quickly loaded with six 400-pound batches.

The places to be patched are carefully cut with vertical sides, the old material being piled at the side, the hole swept out, and the edges painted with asphalt. When the truck arrives, the hot mix is taken out with hot shovels and placed approximately where it is to remain; then it is raked and tamped solid by the use of hot hand tampers.

The hot material is placed in two layers to permit better compacting with the hand tamping. A gang of three men handles these patches on the road. The old material from the patches is taken back to the yard and stored until it is needed to help make a better surface on some dirt street that is in bad shape in one of the outlying sections of town.

Other Types of Patches and Resurfacing

Another type of patching has been tried with success on sections of old bitulithic paving where the foundation was poor. This has been used particularly in some of the sections that have been added only recently to the corporate limits of the city.

The old paving was removed and the edges painted as described for the hot mix, but in addition the base of the hole was painted. Then the hole was filled flush with the surrounding pavement with ⅝-inch chats. Hot asphalt heated on the job in a small Littleford kettle is then poured over the chats to fully penetrate them, and then the surface covered with ⅜-inch chats and hand tamped flush with the pavement.

On one street which was originally paved with granite cobbles the riding surface had become so rough that motor traffic was quite unhappy over it. The cobbles were removed, and four Durax blocks made from each of the larger blocks and the smaller blocks were laid to give a smooth surface on a 1:3:5 concrete base.

The Street Department has 65 men in its service and is responsible not only for all street work but for all construction for the Park Department.

Trucks and Their Operating Costs

REPLIES to the nation-wide survey recently conducted by the General Motors Truck Co., Pontiac, Mich., included 57 questionnaires from municipalities, counties and states, using a total of 1,214 trucks. Of this number, 433, or 36 per cent, were light-duty trucks with capacities from ½ to 1½ tons; 366, or 30 per cent, were trucks of 1½ to 3 tons capacity; and the remaining 415, or 34 per cent of the total, were heavy-duty trucks of 3½ tons and over.

Eighteen of the questionnaires stated that special bodies made and adapted to the requirements of the various departments, were used; 27 reported the use of standard bodies and 10 used both types of bodies.

In 53 places drivers are paid a straight salary, while two of the questionnaires report payment of a salary and bonus.

According to the reports, light-duty trucks averaged 12 miles per gallon of gas and 98.3 miles per quart of oil; medium-duty trucks traveled 7.6 miles on each gallon of gas and 83.8 miles on each quart of oil, while the heavy-duty trucks made only 4.6 miles per gallon of gas and 41.7 miles per quart of oil. An average load for a light truck was reported as 2,429 pounds, for medium trucks 5,662 pounds and for heavy-duty trucks 9,429 pounds. The average haul for light trucks was given as 26.1 miles, for medium trucks 36.5 miles and for heavy trucks 18.6 miles, while operating costs, including maintenance and depreciation, averaged 8.9 cents, 15.8 cents and 20.4 cents per mile, respectively, for the three types of trucks.

Twenty-five communities reported that all hauling and delivery is done by municipally owned trucks and 14 report that some trucks were hired. Eighteen of the questionnaires contained no reply to this question. Of those who hire some trucking done, 6 hire trucks for cartage to and from a railroad, 6 for heavy delivery, 3 for long-distance hauling and 4 for light delivery.

The Regulation of Hawkers and Peddlers in Michigan

BASED on a study made by W. Rolland Maddox of hawkers' and peddlers' ordinances from 32 cities and 10 villages, and transient merchants' ordinances from 17 cities and 2 villages, believed to be representative of municipalities in the state, conclusions and data with regard to the regulation of these traders in Michigan have been published in a bulletin by the Michigan Municipal League.*

Michigan municipalities have ample authority to require licenses from hawkers, peddlers and transient merchants, Mr. Maddox finds after studying the sources of the license powers granted municipalities, and analyzing the opinions of the courts interpreting the legal provisions. Licenses may be required for regulatory purposes only and not for revenue in the case of hawkers and peddlers. Transient merchants, it seems, may be licensed for revenue. "The tax appears to be authorized in place of the general property tax for the period of time the licensee is in business before the annual assessment. The upper limit of the tax can be determined accordingly."

Cities are thought to have, besides the authority to license, the power to prohibit hawking, peddling and trading by transient merchants, but the courts have not ruled on this.

Persons engaged in interstate commerce cannot be required to pay municipal license fees. "The test of whether a person is engaged in interstate commerce is in the non-existence of a stock of goods within the state from which orders are filled wholly or in part. If such a stock exists, the peddler may be charged a fee for the privilege of engaging in that portion of his business which is intrastate. Goods shipped directly to the buyer from outside the state, or to the agent for immediate delivery to a certain buyer, are in interstate commerce." City or village license fees also cannot be required from war veterans licensed by the county clerk for the sale of their own goods.

Licenses must be provided for by ordinance. The terms of the issue of licenses and the qualifications of licensees must be specified. The schedule of fees must be included in the ordinance. The period for which licenses are granted must be specified, and license powers may not be delegated to administrative officers, although a reasonable amount of discretion may be vested in such officers.

The city or village clerk can grant and issue the license, under a properly drawn ordinance. The license should show upon its face the essential information for identification purposes which is also contained in the application, together with the dates of issue and expiration and the signatures and seals of the issuing officers.

The most common penalties provided for ordinance violators are a fine not to exceed $100, or imprisonment not to exceed ninety days, or both, at the discretion of the court.

* See Department of Municipal and Civic Publications in this issue.

FORWARD STEPS

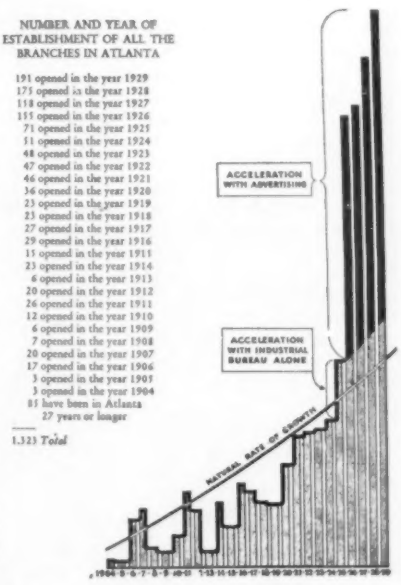
Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

How the "Forward Atlanta" Fund Has Helped Atlanta

ATLANTA, GA.—During the four years from 1926 through 1929, citizens of Atlanta with faith in their city subscribed $722,328.50 to advertise its advantages as a business center. The result has been that 679 new concerns and more than thirty million dollars in new payrolls were brought to Atlanta in that period. The accompanying chart indicates the rapidity of the growth of establishments of all the branches in Atlanta, a total of 1,323.

In 1925 a business depression, chiefly due to psychological reasons, threatened Atlanta because of the Florida boom. To offset this the President of the Chamber of Commerce, W. R. C. Smith, suggested that a nation-wide advertising campaign would not only "tell the world" about Atlanta but would awaken the city to its own resources. A committee was appointed to make a careful study of the city situation; from its reports the Forward Atlanta movement arose. An organization was formed to raise the necessary funds, and the goal of $250,000 was reached in four days. The Forward Atlanta Commission, incorporated since 1927, is a strictly business though non-profit organization, which, while organized outside the Chamber of Commerce, works through it and in close cooperation with it. Each group in the city's economic structure is represented in the Commission by a member chosen by the group itself. Three major committees were appointed, the Finance Committee, the Media and Copy Committee and the Industrial Bureau Committee, as well as auditors and advertising counsel. The Executive Committee consists of a chairman and the heads of the three committees. A Report of the Commission's activities for the years 1926, 1927, 1928 and 1929 includes a detailed statement of the administration of the Fund, which is governed by a strict set of checks and balances.*

Three hundred separate advertisements, reproduced 125,000,000 times by the printing presses of carefully selected publications which reach business executives throughout the country, were prepared under the supervision of the Media Bureau. The fundamental message of all these advertisements was that: (1) no longer can industry hope to serve the entire United States from any one point, however centrally located; (2) the South is America's fastest growing market; (3) Atlanta is Distribution City to the South." In addition to the advertisements, the Bureau prepared books, booklets, pamphlets, folders and circulars, which were distributed to the extent of 163,820 pieces to inquirers, to prospects, to the nation's leading business men and financiers, to public libraries, the United States Department of Commerce, periodicals, etc.


NUMBER AND YEAR OF ESTABLISHMENT OF ALL THE BRANCHES IN ATLANTA
191 opened in the year 1929
175 opened in the year 1928
118 opened in the year 1927
155 opened in the year 1926
71 opened in the year 1925
51 opened in the year 1924
48 opened in the year 1923
47 opened in the year 1922
46 opened in the year 1921
36 opened in the year 1920
23 opened in the year 1919
23 opened in the year 1918
27 opened in the year 1917
29 opened in the year 1916
15 opened in the year 1915
23 opened in the year 1914
6 opened in the year 1913
20 opened in the year 1912
26 opened in the year 1911
12 opened in the year 1910
6 opened in the year 1909
7 opened in the year 1908
20 opened in the year 1907
17 opened in the year 1906
3 opened in the year 1905
3 opened in the year 1904
81 have been in Atlanta 27 years or longer
1,323 Total
ACCELERATION WITH ADVERTISING
ACCELERATION WITH INDUSTRIAL BUREAU ALONE
NATURAL RATE OF GROWTH

The Industrial Bureau of the Atlanta Chamber of Commerce is also a division of the Forward Atlanta Commission, and is in charge of the business of "selling" the city. It answers and follows up all inquiries resulting from the advertising campaign, and conducts trade investigations, researches and analyses. A total of 46,217 inquiries was received during the first four years of the Commission's existence; 560 of these came from 40 foreign countries. Four hundred and forty-six surveys were made to furnish interested manufacturers with data on Atlanta's facilities and the possibilities of the southeastern market.

Since the creation of the Forward Atlanta Fund—probably the largest fund ever raised to advertise a city—Atlanta's retail sales, accepted by economists as the index of the prosperity of a community, have forged conspicuously ahead of those of other cities in the Sixth Federal Reserve District, although formerly they lagged behind. The conclusion is inevitable that advertising has put money into the pockets of Atlanta's citizens.

It is not assumed, of course, that money spent for community advertising is certain to pay profits to the community; but Atlanta's experience indicates that, if a city really has something worth-while to sell, advertising funds intelligently expended will bring definite, traceable, beneficial results.

GEORGE W. WEST,
Chairman, Forward Atlanta Commission.

* The report is available on application. See department of Municipal and Civic Publications in this issue.

Municipal Gas, Water and Electricity Prove Valuable Assets

WINFIELD, KANS.—From a beginning with its municipal water-supply, this city added electricity and gas in turn to its municipal enterprises, and the showing of all of them has amply justified their being undertaken.

At first we were supplied with natural gas by a utility company, and there was continual dissatisfaction about rates. The company had 2,300 consumers, and complained frequently that it was losing money. It kept increasing the rate until it got to be 54 cents per 1,000 cubic feet, plus a service rate of 75 cents a month per customer, and once each customer was charged $32 for the cost of repairing the company's mains. Before the company's franchise expired, in October, 1926, the municipal light plant had made such a good record that the people demanded a city-owned gas plant and voted $242,000 in bonds for it. It was built within this amount by the present administration, to serve 2,900 users. The gas bonds draw 4½ per cent interest, and $24,000 of the principal must be paid off each year.

The minimum rate charged by the municipal plant is $1 a month, which entitles the user to 2,000 cubic feet of gas. For all gas used beyond the 2,000 feet the rate is 30 cents per 1,000 up to 100,000 feet; then 25 cents per 1,000 for the next 100,000 feet and all gas used in excess of 202,000 feet is 20 cents per 1,000. We do not know of another city in Kansas with so low a rate; it is only about $7 a month, the year round, for an average house, for cooking and heating, and the industrial rate is likewise very low, and yet we have paid off $100,000 of our bonds from our profits, have paid all interest promptly, and have a surplus of $29,000 in the treasury from gas profits.

The gas is brought from Texas by producers and is sold to the city at the gas rates. It is used in homes for cooking and heating. The city light and power plant, schools and two colleges, flour mills, all churches, stores, packing plant and factories are heated with gas, which is much cheaper than coal or oil. This makes Winfield a "spotless town."

Winfield's water-supply was formerly the Walnut River, but the development

of oil fields up river caused pollution. In 1923 six wells were sunk in the Arkansas River bottoms, eleven miles away, these going down 53 feet to water-bearing gravel. The water is pumped to Winfield by electricity produced from the municipal power-plant. For a minimum rate of $1 a month, a consumer is entitled to 3,000 gallons of water, and in spite of the low rate the plant has a surplus of $98,000 in the treasury, and the debt will be paid off as it becomes due.

The electric plant is an outstanding money-maker, although with moderate rates. The lighting rate is 8c per kilowatt-hour for the first 20 kwh., grading down by steps of 20 to 4c (and 3c for very large amounts). The power rates start at 4c, and go down to 1c. The average cost for the ordinary home is $1.25 a month. We supply light and power to five towns, the farthest 25 miles away. Various companies have tried to obtain these towns but our rate is lower. We light our streets, parks and all public buildings free of charge, no levy being made, and yet our net earnings, above operation, maintenance, extensions, and depreciation, are over $100,000 a year. We own the plant free of debt, and it could be sold tomorrow for a million dollars spot cash.

The surplus from the electric plant is used to do many things in the course of operation of the city government as a whole, and for such special improvements as a new grandstand and an agricultural building for the fair grounds, costing $48,000 together; flood dikes; and meeting various emergencies, such as relief for flood sufferers in 1928 to the amount of $12,500.

The city portion of the tax rate in Winfield is $5.10 per thousand dollars, and when the water and gas bonds are paid, it is expected that the taxes will be made still lower.

W. J. WELFELT,
City Manager.

A Scientific Approach to Traffic Control in Kansas City

KANSAS CITY, MO.—A 250-page volume, just published,* is the result of a suggestion presented to the Board of Directors of the Chamber of Commerce of Kansas City in March, 1929, by the Civic Department, that a consultant of national reputation be brought to Kansas City to make an intensive engineering study of street traffic conditions and recommendations for traffic control plans.

The Board of Directors approved the appointment of a City-Wide Traffic Committee, composed of representatives of civic and business organizations, civic groups and public agencies. The Chamber of Commerce, under the personal leadership of its President, Conrad H. Manus, assumed the responsibility for obtaining pledges totaling approximately $30,000 in cash and in services from the interests represented on the Committee. The services of the Albert Russell Erskine Bureau for Street Traffic Research of Harvard University, Dr. Miller McClintock, Director, were then arranged for to carry on the survey.

Of special importance in the report, now published, is the text of a proposed Consolidated Traffic Code for Kansas City. This is based largely on the latest recommendations of the National Conference on Street and Highway Safety, but includes numerous provisions of a specialized character adjusted to the conditions and requirements revealed in the comprehensive study. An unusual feature of the study was the detailed analysis of the contributions to retail trade made by various types of transportation, including both the number of sales and the value of sales. This is the second time such a study has been conducted, the other instance being in Washington.

* See department of Municipal and Civic Publications in this issue.

IMPORTANT RECOMMENDATIONS

Among many other recommendations discussed in some detail in the report, and illustrated in most cases with maps and graphs, may be mentioned the following:

"It is concluded that traffic and business conditions will be improved if retail establishments in the central district open at 9:30 A. M. and close at 6 P. M. . . .

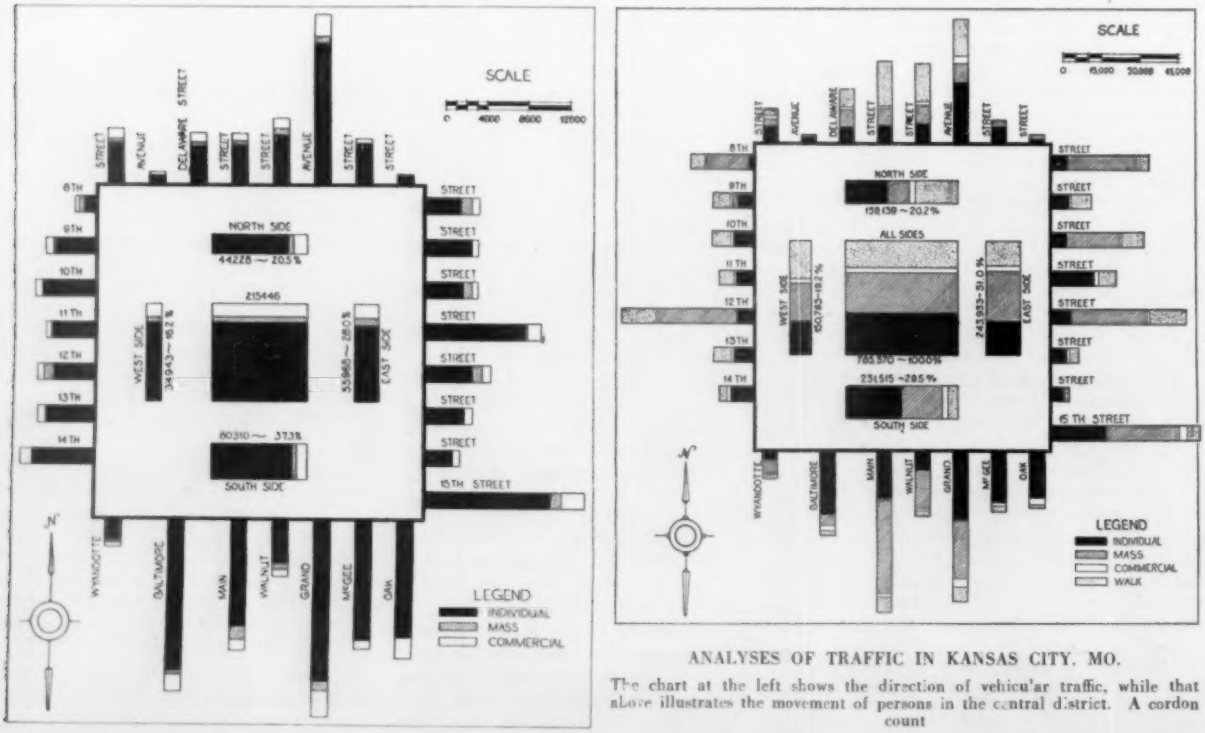
"Preventive activities should be amplified for the period of greatest accident frequency. These periods are the daily hour from 5 to 6 P. M., the weekly period of Saturday and Sunday, and the annual period represented by the months from August to December, inclusive.

"Similarly preventive activities and enforcement should be amplified at those locations in the city revealed as being especially hazardous.

"An adequate driver's license law should be passed by the state of Missouri, in order that drivers' skill and discipline may be increased.

"The consolidated traffic ordinance of the city should be used as the basic textbook for the formulation of sound driving habits, and should be published and distributed gratuitously to all drivers who request copies. Traffic warning signs should be used much more generously than they have been in the past.

"There should be an amplification of



ANALYSES OF TRAFFIC IN KANSAS CITY, MO.

The chart at the left shows the direction of vehicular traffic, while that above illustrates the movement of persons in the central district. A cordon count

the plan for the collection, analysis, and application of accident statistics.

"The safety educational activities of the public press, the Kansas City Safety Council, the Police Department, and other agencies should receive continued public approval and support.

"There should be a great increase in the firmness and certainty of enforcement methods with special respect to acts which are of a hazardous character. . . .

"In new buildings special attention should be paid to the incorporation of parking facilities within building lines, or in locations closely adjacent. Business interests should foster the construction of central district garages, a further development and utilization of parking lots, and should consider the special advantages to be obtained from the so-called self-contained block.* . . .

"Platform safely islands, properly protected and illuminated, should be constructed in the centers of wide streets with heavy vehicular and pedestrian traffic, and at street-car stops. Temporary minimum protection at such places should be provided by improved button-marked zones.

"Where such minimum standard temporary zones have been established, the prohibition against vehicles operating to the left of zones at street car stops should be removed. . . .

"There should be an amplified use of traffic control devices.

"Traffic signs and markings should conform to the standard set forth by the National Conference on Street and Highway Safety. . . .

"A continued application of sound engineering practices with respect to traffic control measures requires the establishment of an adequate and responsible technical agency. It is recommended that there be established in the Public Works Department a traffic engineering office, and that certain specific responsibilities in connection with traffic planning and adjustment be assigned to the Director of the Public Works Department. . . .

"The efforts of the Police Department should receive the firm support of public opinion, and of the courts. Patrolmen as well as special traffic police should be require to report traffic violations. . . .

"Courtesy cards or other mechanisms for extending special privileges to individuals or classes should never be used in the future."

BENEFITS GREATLY EXCEEDING COSTS

The report points out that the millions of dollars, the scores of lives, and the hundreds of injuries annually involved in traffic waste at present in Kansas City would justify large expenditures for improved conditions. Fortunately, the application and enforcement of sound traffic control measures involve very nominal expenditures. The consolidated traffic ordinance contained in this report will involve only such charges as may be necessary for the printing of the document, and the minor changes in required traffic signs. Its adoption should in no manner increase expenditures required for enforcement.

The specific recommendations for changes previously contained in this summary, and explained in the report proper, will necessitate moderate appropriations. It should be noted, however, that moneys expended for an expanded signal system, suitable standard signs, and the physical protection recommended for pedestrians, are in the nature of capital expenditures. They should not be concurrent except as a growth in the traffic problem necessitates elaboration. Furthermore, it is believed that each recommendation carries its own economic justification, and will return in economic as well as in social values amounts far greater than those required for their application.

RAY W. WILSON,
Secretary, Civic Department, Chamber of Commerce.

* See page 104 of this issue.

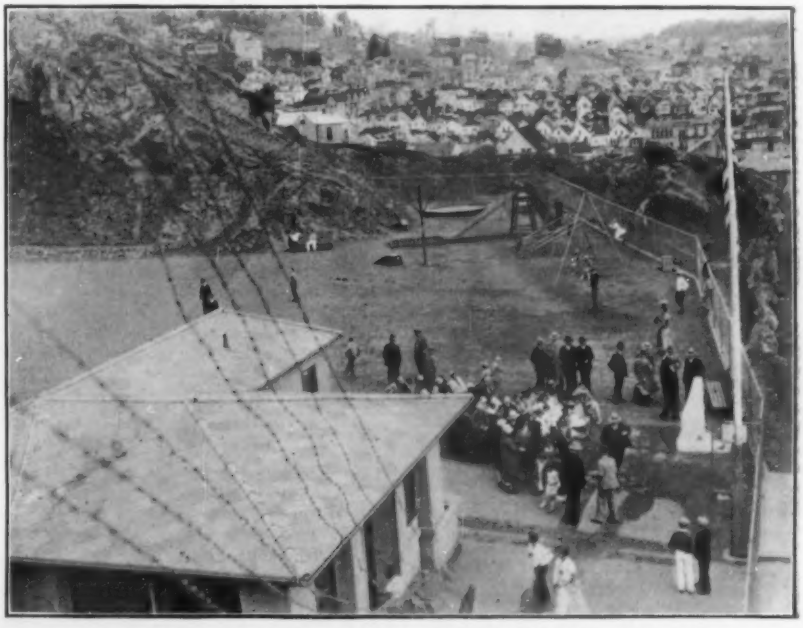
Safe Play in an Abandoned Quarry

SAN FRANCISCO, CALIF.—The new 3½-acre Douglas play area operated by the Playground Commission of this city occupies an abandoned quarry site, and does a valuable service in keeping children off the dangerous streets of the section. It includes facilities for baseball, basket-ball, and volley-ball, and is also equipped with play apparatus. A special area is provided as a babies' playground. The East and West of Castro Street Improvement Club has presented the playground with a beautiful drinking fountain, an illustration of which is reproduced. It was designed by B. Jacques Schnier, and is exceptionally modern both in design and decoration. The fountain is of concrete with a marble bas-relief decoration, and beneath it an inscription. The bowl lining is of turquoise and cobalt blue. The bubbler is of the type that cannot be touched by the lips of the drinker.

THE MODERN DRINKING FOUNTAIN IN THE DOUGLAS PLAYGROUND, SAN FRANCISCO

When work began on this playground, there was a semicircular flat area surrounded on three sides by overhanging rock. Precipices had a maximum height of 120 feet. These precipices were reduced to a safe natural slope by breaking down the rock from the top and permitting them to lie at a safe angle of repose at the base.

Approximately 5,000 tons of soil and broken rock were rolled down the face. The rock was covered with 2 feet or more of loam, and about 2,500 trees were planted to beautify the site and break up wind currents, and later to provide mountain trails which will be safe for children to use in climbing to the top, from which point there is an excellent view of San Francisco. A Cyclone steel fence surrounds the playground.



THIS NEW SAN FRANCISCO PLAYGROUND IN AN ABANDONED QUARRY IS ENCLOSED BY A HEAVY WIRE FENCE

GIRDLED CAROLINA POPLARS IN NORTHWOOD SUBDIVISION, ROYAL OAK, MICH.

A water line has been laid along the top of the hill, supplying water for irrigation. On a hill above the site 1,500 trees have been planted as a windbreak.

Some of the boulders that were brought down during the blasting weighed as much as 10 to 15 tons. These have been built into a dry rock wall at the base of the fill to support the slope. At the base of the slope is a 10-foot rubble wall defining the playground area. The large rocks were pushed into place by the use of a Caterpillar tractor, a heavy timber being placed between the front of the tractor and the rock to be moved.

C. W. GEIGER.

Large Poplars Condemned to Death as Sewer Enemies

ROYAL OAK, MICH.—Again the Carolina poplar, *Populus deltoides, Marshall,* has been accused, brought to trial, adjudged guilty, and condemned by the citizens of a municipality. More than 390 trees of this species standing in Northwood subdivision, Royal Oak, one of the most beautiful subdivisions in Oakland County, have been girdled and are to be removed this autumn.

The trees were planted in 1900 by Dr. Firman Clawson, subdivider of Northwood. During the thirty years of their Northwood sojourn they have attained an average height of 55 feet, and an average girth of 60 inches. Because of their rapid growth the Carolina poplars gave the almost immediate landscape effect so often desired by subdividers.

Until this year the trees gave no evidence of the undesirable traits which are usually associated with city-grown members of this species. The sewer maintenance department of the city of Royal Oak began to receive complaints concerning sanitary sewers in Northwood early this spring. In several instances investigations disclosed complete stoppages of the sewers by poplar roots.

POPLAR ROOTS REMOVED FROM NORTHWOOD SEWERS, ROYAL OAK, MICH.

Two tons of roots were removed from a 1,000-foot section of 15-inch sewer at a cost of $266, or 26.6 cents per foot. The sewer, laid in 1920, was carefully constructed, oakum and cement mortar having been used to seal the joints. So dense was the growth of the roots in the sewer crock that a special cleaning tool had to be devised to effect their removal. Even with the new cleaning implement it was found necessary to break holes in the sewer every 175 feet. Very little other foreign matter was found in the line.

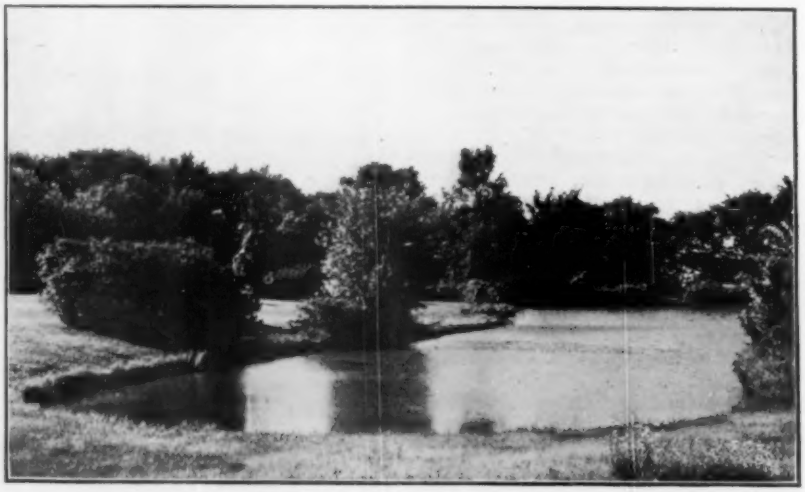
In commenting upon the condition, City Manager Raymond J. Whitney says: "Fine roots of the trees force their way through minute holes in the outer structure of the sewer crock, some roots penetrating through holes so fine that water will not leak from them. These roots, once inside the sewer, have offshoots which grow to such size as to completely fill a sewer. The roots cause damage both through blocking the sewer and through causing it to crack and deteriorate quickly. Elimination of the trees is the only cure for the evil."

Mayor H. Lloyd Clawson, principal owner of Northwood subdivision, is considering the planting of elms and hard maples to replace the poplars.

JAMES G. MATTHEWS.

A Big and Beautiful Park in a Little Village

CAMP POINT, ILL.—In a photographic competition held under the Better Community Movement sponsored by Illinois University, Bailey Park, the 30-acre recreation area of our village, was adjudged one of the One Hundred Beauty-Spots of the State of Illinois. It might be asked how a village of 1,000 inhabitants came into possession of an area of such beauty and size. The answer is, by purchase and gift. Ten acres was acquired by public purchase, and Thomas Bailey, formerly Camp Point's leading citizen, donated the other 20 acres.



THE LAGOON IN BAILEY PARK, CAMP POINT, ILL.

Moved by the nearby example of the creation and development of the Quincy park system, the people of Camp Point decided to beautify their park under direction of a first class landscape gardener. E. J. Parker, of Quincy, the "father" of the Quincy park system, lent his influence to his neighbors to help them secure the services of O. C. Simonds, of Chicago, one of the foremost landscape gardeners of the Middle West.

The park is governed by a commission of three. One commissioner is elected each year and serves for three years. For the support of the park the commissioners levy each year a tax of $500 on the property of the village.

Recently there was brought into the park from a distance of four miles a 20-ton glacial-drift boulder. This wild wanderer had long lain in a sequestered spot, but has been given a place from which it will tell to the children of our school and to many thousands its tale of the past.

GEORGE W. MOCKMORE,
Mayor.

Asphalt Surfaces for Airport Runways

By **A. J. MOYNIHAN**

TRACTOR-DRAWN GRADER MIXING TEXACO SURFACING MATERIAL AND EARTH AT WICHITA, KANS., AIRPORT

THE public interest in aviation can best be illustrated by the attendance at the annual National Air Races. Approximately 600,000 people attended the air races at Cleveland, Ohio, in 1929. When the Tenth Annual Meet was held in Chicago between August 23 and September 1 of this year, even this record was exceeded.

The public along the air-mail routes are very familiar with the sound of the motors of the mail planes, and today it would be almost impossible to find a community that is not giving some thought to building an airport.

The Aeronautics Branch of the United States Department of Commerce is spending considerable time and money in the study of airports. The various states will shortly have aeronautic codes, and permanent airport licenses will be granted to communities having facilities that measure up to the requirements set forth in these codes.

The automobile's need for good roads is today being paralleled by aviation's demand for improved airport runways. An airport runway is to the pilot of a plane what a good road is to the driver of an automobile. No longer is the airplane pilot satisfied with a makeshift landing field that is a mudpuddle in rainy weather or a cloud of dust in dry weather. His need is for runways which are at his service all the year around, no matter what weather conditions happen to exist.

The construction of a modern runway is much the same as the construction of a roadway. Drainage, grading, foundation and wearing surface must be considered. The location of runways, when but one or two runways are projected, brings up the problem of laying them out so as to take advantage of prevailing winds, a matter of utmost importance.

Types of Treatment

The amount of money available for runway improvement, as a general rule, governs the type of construction which is adopted. The available types vary from a treatment with asphaltic oil, when funds are limited, to an asphaltic base covered with a sheet-asphalt or asphaltic concrete wearing surface. Sheet asphalt is a scientific mixture of asphalt cement and graded sand at comparatively high temperature; asphaltic concrete is a scientific mixture of asphalt cement and stone of uniform size, also at comparatively high temperature. The various types of asphalt runways can best be classified as follows:

(1) Earth and gravel or stone, treated with cut-back asphalt

(2) Retread and penetration macadam

(3) Asphaltic base with sheet-asphalt or asphaltic concrete surface

SPREADING STONE COVER MATERIAL OVER APPLICATION OF ASPHALT CEMENT AT AMARILLO, TEXAS, AIRPORT

Methods of Construction

In the construction of the first type of runway, the ground is plowed and bladed in windrows. The depth to be treated varies from six to nine inches. After the first application of cut-back asphalt is made to the subgrade, a 2½- to 3-inch layer of earth and gravel is spread uniformly, after which a second application of cut-back asphalt is put on. This is harrowed and rolled and then another layer of earth and gravel is spread. The same procedure is continued until the required depth is secured.

The asphalt-stone retread type of runway consists of a mixture of asphaltic material and crushed stone, made in successive applications of the asphalt to a layer of stone spread on the subgrade. The mixture is kept smooth by use of a grader or planer, until the asphalt hardens sufficiently to cause the stone to compact under the roller. The depth of the layers depends largely on the volume of traffic anticipated at the airport.

The penetration-macadam runway is built over a well-compacted gravel or waterbound macadam base, and is usually laid in a 3-inch layer. The stone aggregate is spread uniformly over the base, and the asphalt applied in successive applications by a truck pressure distributor, until the proper amount of asphalt has been used. A seal coat of asphalt is then applied and stone chips are uniformly spread over the entire surface.

The most durable of the asphalt types of airport runways consist of an asphalt base with a sheet-asphalt or asphaltic concrete wearing surface. The asphalt base, which consists of a mixture of stone, sand and asphalt, is laid, as a rule, in 2½- or 3-inch layers. It is then covered either by a 2-inch asphaltic concrete top, or a sheet-asphalt surface 1 inch or 1½ inches thick. The thickness of base and wearing surface is governed by the available funds, and what the airport officials deem best suited to their needs.

What Is Sewage Treatment and Why Is It Necessary?

Part II

By FRANK C. ROE
Shields, Jordan & Roe, Chicago

THE SEWAGE TREATMENT PLANT AT SANTA CRUZ, CALIF.
The equipment includes 2 Dorrco 6 x 6-foot screens which remove 20 cubic feet of screenings per 24 hours from a flow of 1.8 million gallons

THE first studies in sewage treatment were begun in London in 1856 and in Lawrence, Mass., in 1887. Various processes have been devised, too numerous to describe in detail, some of which are still serving, but most of which have fallen into disuse or have been replaced by more modern methods. Some of the older types were known as the Alum, Blood and Clay process, the Travis hydrolitic process, and the Miles Acid process.

Modern Methods of Sewage Treatment

Present-day sewage treatment may be divided into three groups as to quality of treatment—preliminary, secondary, and auxiliary. Secondary treatment requires preliminary treatment, as the name implies. Before going into brief descriptions, the following outline is presented to classify each process and make the subdivision clear to the layman:

I. Preliminary Treatment
  A. Coarse screens
  B. Grit chambers
  C. Fine screens
  D. Settling tanks
    1. Septic tanks
    2. Imhoff tanks
    3. Plain hopper-bottom tanks
    4. Mechanically cleaned tanks

II. Secondary Treatment
  A. Filtration
    1. Contact beds
    2. Stone (trickling) filters
    3. Intermittent sand filters
  B. Activated sludge
    1. Mechanical surface aeration
    2. Diffused air
  C. Contact aeration
    1. Submerged racks
  D. Final settling tanks
    1. Hopper-bottomed
    2. Mechanically cleaned
  E. Sterilization
    1. Chlorination

III. Auxiliary Treatment (of solids removed)
  A. Sludge digestion
    1. In septic tanks
    2. In Imhoff tanks
    3. In separate tanks
      a. Plain
      b. Watertight cover
      c. Floating cover
      d. Mechanically agitated
  B. Sludge disposal
    1. Without digestion
      a. Pressing
      b. Centrifuging
      c. Filtering
      d. Drying
    2. Following digestion
      a. Lagooning
      b. Sand drying beds
        Open
        Covered

Other Methods of Classification

All the above processes, as well as the obsolete processes, may be classified further as mechanical, chemical, or biological. Such a classification is not separated by rigid lines, but will overlap in many methods of treatment. Mechanical methods are exemplified by screens and settling tanks, chemical methods by the old precipitation processes and by modern chlorination, and the biological methods, which are the most important of all, by the septic tank, trickling filter, activated sludge process, and sludge digestion.

A complete description and explanation of each method listed in the foregoing outline would be highly technical and extremely long. Such a description would exceed the limitations of this writing and would defeat the purpose for which it is intended; consequently the feature of the following descriptions is brevity.

Preliminary Treatment

For preliminary treatment, by which a large quantity of the suspended matter in sewage is usually removed, there are: coarse screens, which remove the larger objects, thus protecting pumps, etc.; grit chambers to remove heavy inorganic particles such as sand, pebbles, toothpaste tubes, etc.; while fine screens remove the larger suspended solids in the sewage, thus reducing the load placed on secondary treatment. Preliminary settling tanks are used more often than fine screens, however, and from 20 to 60 per cent of the total suspended solids are settled out of the sewage thereby.

Secondary Treatment

Secondary treatment, by which most of the fine (colloidal) particles suspended in the sewage are removed, may be accomplished through filtration by allowing the semi-treated sewage to flow through stone or sand filter beds, where it is oxidized and the fine solids retained. The solids retained are partially reduced to a liquid by bacteria which are present in the filtering material. Another process, which is probably the most highly developed and successful method of modern secondary treatment, is called the "activated sludge" process. This type of treatment consists essentially of supplying oxygen in the form of air to the semi-treated sewage, along with a large quantity of light, flaky sludge containing billions of bacteria; hence the term "activated sludge." Oxidation and adsorption[4] of the fine colloidal particles in the sewage by the added activated sludge ensues during an aeration period of from six to twelve hours.

Activated sludge is produced either by forcing air through porous plates at the bottom of what are called the aeration tanks, or by agitating the sewage at the surface of the tanks in a manner that will cause circulation and will bring the liquid into contact with the atmosphere continuously. The first type is called "diffused air," and the second is called "mechanical surface aeration." Contact aeration is a sort of combination of the principles involved in the filtration and activated sludge methods, since the sewage is brought into contact with bacteria

[4] Adsorption—the action of one body in holding another body on its surface.

that exist on submerged surfaces (usually wooden racks) and whose existence is dependent upon a supply of oxygen which is delivered as compressed air below the racks.

All the above methods of secondary treatment except the sand filter require final settling or sedimentation tanks. That is, the material which accumulates in the stone filters and on the surfaces of contact aerators sloughs off periodically and can be removed from the treated sewage by settling in tanks. Also, the sludge which is added to the sewage in the activated sludge progress plus the solids which are absorbed from the sewage thereby, must be removed by settling in similar final tanks. The sludge which collects in the bottom of the final tanks is removed to digestion tanks as a rule, except in the case of activated sludge, where a part of it must be returned to the sewage entering the aeration tanks, in order to carry on the process. Where the discharge from the final tanks, properly called the plant effluent, empties into a stream that is used at some close point below for a water-supply, it may be sterilized by chemical methods, usually chlorination.

Auxiliary Treatment

Auxiliary treatment consists of the methods by which the products of preliminary and secondary treatment may be made fit for final disposal. The digestion process, which is essentially the same regardless of the type of tank, consists of reducing and decomposing the solids collected in preliminary or final settling tanks. This is accomplished by bacterial action which changes the material to a black, heavy, and non-offensive sludge.

The bacterial action of sludge digestion differs from that employed in the secondary processes of sewage treatment, in that no oxygen is necessary to sustain bacterial life. The reduction of sludge volume during digestion is explained by the fact that when the billions of bacteria feed on the mass of fresh solids from the settling tanks, they convert the greater part of it into gases or liquids, which are given off or flow away, leaving the heavier sludge and ash deposit in the tank.

Where septic tanks are used for settling, the digestion process goes on at the bottom of the tank; which is also true of the Imhoff tanks, except that the Imhoff tanks are so constructed that the solids which settle out in the settling compartment are permitted to enter a trapped digestion compartment. Thus, the gas which is given off during the digestion process does not bubble up through the settling compartment carrying with it sludge and scum, which at times, as in the case of the septic tank, would make the discharge worse than the incoming sewage.

Separate sludge digestion tanks are by far the most satisfactory; primarily because their operation can be definitely controlled without disturbing settling processes. Many digestion tanks are now built with tight covers and with equipment which collects the gas given off by the process. The gas has a higher calorific value than commercial gas and is used for heating buildings, running gas engines, etc.

Very often it is not practical to dispose of the excess sludge produced in the activated sludge process by digestion, on account of its large quantity, so drying equipment consisting of filters, presses or centrifuges for dewatering[5], and rotating heated dryers, are used to make the sludge fit for handling. This is an expensive process, but produces a dried sludge that has a market value of from $10 to $30 per ton as a fertilizer.

The sludge treated in digestion tanks is usually withdrawn and used for filling waste areas (sometimes called lagooning) or it is discharged on to well-drained sand-beds, where it dries without artificial aid to an inoffensive dark "cake," which may also be used for a fertilizer. Modern sand drying beds are often equipped with glass roofs, similar to greenhouse covers, in order to permit efficient drying in wet and cool weather. The covers also add to the appearance of the plant and aid in the control of odors.

Choice of Treatment Methods

All the methods of sewage treatment, with their auxiliary processes as herein described, have advantages and disadvantages one over the other, dependent upon local conditions. Recent installations seem to indicate very favorable results by the mechanical surface aeration method of the activated sludge process for secondary treatment. The first cost appears to be appreciably lower than for other methods, and the operation costs less than the diffused air method of the activated sludge process, particularly in the case of small plants. Other advantages which apply regardless of local conditions are the absence of objectionable odors (this applies to all activated sludge), and the small loss of head[6] through the plant, which means that no pumping of sewage is required for plant operation proper.

[5] Dewatering—removal of water content.

Intelligent Operation Necessary

Probably the chief reason for the failure of sewage treatment plants serving communities of less than 10,000 population, has been the lack of proper attention and operation. Here, again, the mechanical equipment shows an advantage, because a competent and intelligent operator must be on duty every day to keep the equipment running properly, and consequently the plant receives the care and attention commensurate with its importance to the community and to the function which it performs.

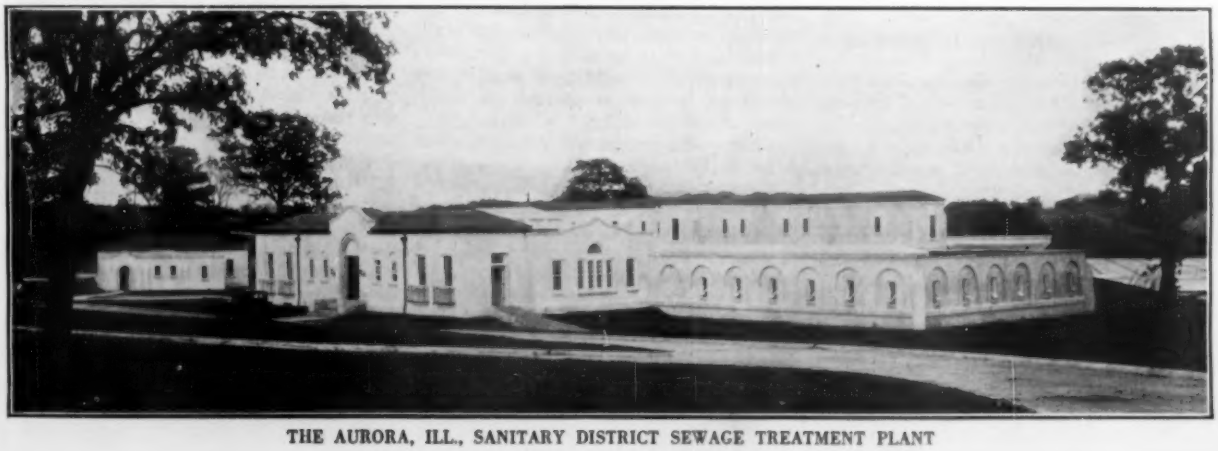
Essential Steps in Solving the Sewage Treatment Problem

After becoming convinced of the essential requirements of their community, the officials thereof are very often at a loss as to what step to take to accomplish the desired result. They must follow certain requirements of their state health department and at the same time must proceed in a manner that will cause the citizens to keep faith in them. Usually, the first procedure is to retain a competent firm of consulting engineers to make a complete survey and submit a report covering all feasible solutions of the problem, together with cost estimates and a recommendation of what is deemed to be the most efficient and economical solution.

Financing

The logical question which follows is:

[6] Loss of head—the drop in elevation necessary to carry the sewage from the plant inlet to the final outlet.



THE AURORA, ILL., SANITARY DISTRICT SEWAGE TREATMENT PLANT

"How will the project be financed?" Here, again, local conditions will govern. The usual methods of financing are by bond issue, assessments, or the formation of a separate board or commission which has its own bonding power. In some states such separate commissions govern what are called sanitary districts, which very often include several cities within their boundaries, as in the case of the Sanitary District of Chicago.

A point in favor of forming a sanitary district, in the event of a community's having taken on the limited amount of bonded indebtedness for other purposes, is that the sanitary district law invariably provides that an addition may be made to the annual general tax. This addition is to be used for maintenance and operation of the works of the district as well as for the retirement of bonds. Some states, however, have recently passed a sewer rental law which also provides for the operation and maintenance of the treatment works and retirement of bonds, thus making unnecessary the organization of a sanitary district.

Private corporations have lately become interested in financing and operating sewage treatment works, just as they now own and operate water-works and power-plants in many communities. Their payment may be effected by a flat rental for all connections to the sewers, or may be based on water consumption if water meters are in use, since the domestic sewage flow in communities having well-constructed sewers should be practically identical with the water consumption.

Design and Construction

Assuming that a means of financing is available or has been created, the officials are then concerned with the design and construction of the project. The cost of the report secured from their consulting engineers will probably be saved by employing the same engineers for the design, as all local facts and conditions governing the design have already been accumulated by those engineers.

Unless the community has a competent engineer of its own, the same engineers should be employed to supervise the construction of the work also. Usually a city engineer is too busy with paving and other extensions to do justice to work of this nature unless he has an able force of assistants.

Again—Intelligent Operation

It is imperative to point out here that the real work just begins when the construction of the plant is completed. The officials may honestly sit back and feel that they have performed a service to the community and have accomplished something worth while. While this is a pleasing fact, constant attention by technically trained and able operators must be given to the plant thereafter, and to the attainment of this condition the official must now bend his efforts.

It may not seem feasible to employ the services of a highly trained man as plant operator in a town under 10,000 population, in which case a good practical man should be selected and the plant placed under the care of consulting engineers who make operation and maintenance their business. This service is accomplished by periodical visits to the plant, followed by reports and instructions to the operator, and may be secured for very nominal fees.

Conclusion

In bringing this brief narrative of sewage treatment to a close, the writer wishes to stress again the importance of giving the subject serious thought. It is not the wish of the engineering profession to force the subject and to indirectly promote work for personal employment, because all professions are eventually governed by the law of supply and demand. If the people served by engineers are brought face to face with the problem, however, and are shown that it should and can be solved, the objective of this story of sewage treatment is attained.

Chambers of Commerce and Civic Development

AS a stimulus and an aid to the civic work of local chambers of commerce, the Civic Development Department of the Chamber of Commerce of the United States is becoming an increasingly useful factor in municipal progress. Under the direction of F. Stuart Fitzpatrick, Manager, and Gardner S. Rogers, Assistant Manager, the Department's field service to commercial organizations on city problems, now in the beginning of its third year as a major departmental activity, has covered 140 cities and 27 states. Requests have been received for this service from 65 additional cities located in 20 states, and many of the cities already served have asked for return visits.

These figures are especially significant since it is the policy of the Department to serve no organization unless invited to do so and unless the organization served is willing to pay its pro rata share of the expense incurred.

In a report submitted at a meeting of the Civic Development Committee in Washington on September 19, Mr. Rogers said in part:

"The primary requisites of a municipality are well known. They are: the systems of transportation and communication; the use to which property may economically be put; educational facilities; protection of persons and property and recreation.

"The technique of developing these requisites is either well known or may easily be secured, but how these requisites may be adequately provided for is a subject worthy of serious thought.

"Concisely stated, the problem is this: In order to increase its population, or even maintain its present population, a city must so develop as to become as satisfactory a place in which to live, work and play, as its competitors; and yet with municipal development only partially complete, taxes have doubled in the last ten to fifteen years, and many cities are having financial difficulties. The solution is planning, but if, and only if, the plans are properly prepared and properly carried out. . . .

"Thus a program for a uniform development of all municipal functions, based upon present conditions and probable future growth, is the first and most important step to be taken in placing a city on an economic basis. The second step, namely, the carrying-out of the program, is equally difficult and requires the energies and cooperation of all interested in the city's well-being. It is not suggested that the actual work of developing and carrying out the program noted above be undertaken by local chambers of commerce, but it is believed that they should be so familiar with the local situation that they may act as a stimulating and guiding influence."

To Demolish Unsafe and Insanitary Structures

UNDER authority granted by the last session of the State Legislature of New Jersey, the village of South Orange has passed an ordinance defining "what building or structure shall constitute a nuisance, and to provide for the abatement thereof." The first violation of this ordinance is now in process of abatement.

Among the ordinance provisions are these:

"That any building, wall, or structure erected on a plot or lot in the village of South Orange which, on account of lack of repairs or by reason of dilapidated condition, or for any other cause, becomes dangerous to life or health, or might tend to extend a conflagration, shall constitute a nuisance"; that notice shall be served on owner or agent containing definite statements of the violation charged, and directing that the condition be corrected either by repairs, specifically listed, or by demolition; that in the event of failure of compliance, authority is given the municipality to abate the nuisance and to charge the costs thereof as a lien, on the records in the office of the Tax Collector. Right of appeal within ten days after action under the ordinance is given the owner or agent.

Section 7 provides that "whenever it shall come to the attention of the governing body that, due to conditions existing on any lot or plot, a nuisance is created detrimental to the safety, health and general welfare of the community, said governing body may pass a resolution declaring conditions complained of to constitute a nuisance within the meaning of this ordinance and providing for the abatement thereof in the same manner as provided herein."

A County Establishes Its Own Hydroelectric Plant

By W. P. FLEMING
Secretary-Treasurer, Power Commission of Crisp County, Cordele, Ga.

CRISP COUNTY, GEORGIA, has the unique distinction of having established the first county-owned and county-operated hydroelectric power system in America. The first unit, which, together with its stand-by steam plant, will produce 19,200 horsepower, has been constructed on the Flint River fourteen miles southwest of Cordele, the county capital, and began operation by delivery of current to the white-way of Cordele on August 1. Since then customers using current for dwelling, commercial, and industrial purposes have been connected as rapidly as practicable.

Construction was started in October, 1928, and but for high water the work would have been completed earlier. A reinforced-concrete dam creates a lake of over 7,000 acres, the water in the river being backed up for about 33 miles. The spillway section of the dam is 408 feet long, with fourteen 25-foot tainter gates. The power-house has a concrete substructure and steel and brick superstructure, and is 150 feet long and 40 feet wide. Two of the four water-wheels have Francis runners and develop 3,600 horsepower each at 30-foot head; they are direct-connected to 3,000-kva. generators. The other two have impeller-type runners and are of 3,000-hp. capacity at 20-foot head; they are direct-connected to 5,000-kva. generators. This design will permit operation from an 8-foot net head of water to a 30-foot net head, delivering 3,600 to 19,200 horsepower.

This project on the part of the county was made possible by a state-wide referendum vote whereby the constitution of Georgia was amended, authorizing an increase of bonded indebtedness of the county in the sum of $1,250,000 in excess of that of seven per cent of the property valuation allowed under the general law. In accordance with provision of the amending act, a county-wide referendum vote was also had directly on the question of issuance or non-issuance of these bonds. This vote was practically unanimously in favor of the bond issue.

Various Interests Promoted

The constitutional amendment provides for a Power Commission of Crisp County having a membership of seven, who had the handling of proceeds from bond sales for acquirement of properties in connection with, and for construction of the county plant. This commission was organized on January 5, 1927; construction was begun November, 1928, and completed in July, 1930. This project, Federal No. 659, is under government license and supervision, and its purpose is defined in the Georgia constitution as "for promotion of the commercial, agricultural, and industrial interests of Crisp County." No fanciful notions prevail here as to "electrification" of the county except on a sound business basis.

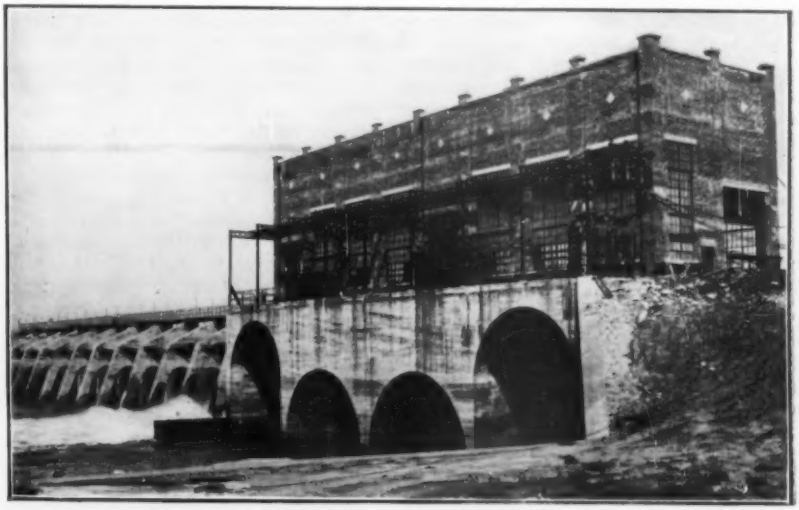
The favorable attitude of the people of Crisp County towards this "unprecedented venture in public ownership," and the initial steps towards an effort at production and delivery of electric current as a necessity of the people, were inspired and justified by the hazardous and inevitably disastrous conditions existing here with respect to the county's basic industry—farming. No unreasoning adherence to theories of public ownership prevails except as thus indicated. Large benefits have already accrued to Cordele and Crisp County in consequence of this heroic undertaking. Industrial development is surely coming on a sufficiently large scale to provide ready markets for the farmers' produce, and remunerative employment for men and women. The exodus of county people who were enticed by the alluring prospects of distance has been put in reverse. They have returned and many of them are in satisfactory business here.

Incidentally, this plant will afford a unit of measurement with respect to production and delivery cost of electric current; and may open a wide and hitherto closed field of engineering activity on behalf of other communities that, as was the case in this community, have had their interests throttled by exorbitant rate charges of serving companies and their natural resources exploited for private gain. The successful operation of the Crisp County plant will have state and national significance.

Other Communities Interested

Neighbor towns and cities in Georgia join in this well-wishing attitude towards what has sometimes been characterized as a "public-ownership venture." Many are already either desirous of connecting up with the Crisp County plant for current at reduced rate charges, or are making protest against charges not on a parity with those promulgated by the company heretofore serving this community, as effective only in this community, and therefore discriminatory with respect to every other town and city in Georgia. This company on August 19, within three weeks from the date on which the Crisp County plant began operation, made a slash of 50 per cent in rates for all uses of current, over and above the service and demand charges, in Cordele only.*

Payment of principal and interest of the bonds sold for this project is provided for in the amending act, now a part of the constitution of Georgia, in that these bonds are a general lien on all properties of the county, payable by unlimited tax, and are also a special lien on the properties acquired by expenditure of the bond proceeds. All power-plant properties so acquired, and also the bonds, are tax free. The County Power Commission makes the county rates for current, free of supervision by the state public service commission.



DAM AND POWER-HOUSE OF CRISP COUNTY HYDROELECTRIC PLANT

The possible income from sale of current produced by the plant is, at one cent a kilowatt-hour, more than a half-million dollars a year. Less than half that yearly income would pay operation expense, retire the bonds, and turn into the county treasury more than the amount of all taxes heretofore assessed for all county purposes. It is not an idle dream, therefore, that Crisp County may, in due course of time, be tax-free as a result of having furnished its own people one of their necessities at a saving.

The controlling policy in the operation of this county plan will not be that of piling up all profits possible. It is expected that surplus will be absorbed by reduction of rates to the people of the county, to whom the plant belongs.

* See "Cut-Throat Electric Rates," page 159.

A National Occasion for Merrymaking

ACTORS AND AUDIENCE, MIAMI BEACH, FLA.

ALL HALLOWE'EN, through the efforts of municipal recreation organizers, has taken its place among nationally observed dates. Unique among them, it is set apart for celebrating the spirit of nonsense. In towns and cities in every part of the country, after nightfall on the last day of October, revelry and prankishness prevail. Many types of organization are current, but the Glens Falls, N. Y., experience is typical: "Everyone has a glorious time, and there is a complete absence of rowdyism."

Glens Falls has held its Hallowe'en celebration for three years. Manufacturing and retail concerns, schools and social and civic organizations of that city, all join in a huge parade, to the delight of thousands of spectators, young and old. Last year there were fully one hundred elaborate floats, as well as bands, grotesque animals by the score, clowns, groups of marchers, decorated automobiles and horse-drawn vehicles of ancient vintage. Carnival spirit pervaded the throngs on the side lines as well, and for an hour or two, hundreds of merrymakers in fantastic and colorful costumes mingled with the more soberly clad spectators.

This annual celebration was inaugurated by the Outing Club, an organization closely allied with the Municipal Recreation Commission in promoting public recreation, and the Chamber of Commerce was asked to cooperate. The object of the celebration was to take care of the urchins whose one aim in life on this night of pranks has been to ring-in fire-alarms and steal gates. Considerable doubt was expressed, prior to the first parade, as to the feasibility of the undertaking. However, when the affair proved the largest community event ever staged in the city and accomplished the purpose for which it was planned, Glens Falls promptly accepted a Hallowe'en parade as an established annual event and began planning for the next one.

In Evansville, Ind., Hallowe'en is the biggest occasion sponsored by the Municipal Recreation Department, and is organized by Parent Teacher Clubs and school officials. Unlike the Glens Falls event, it is staged in neighborhood units, usually with a parade beginning and ending at public and parochial schools. Thousands of young and old take part in the parades and in the programs of stunts held in the schools afterwards, with the awarding of prizes, and with a huge bonfire as a grand finale.

In Los Angeles, Calif., still another form of celebration is encountered in the carefully prepared dramatic events offered at each principal municipal playground. In Chicago, the Rules and Regulations for Municipal Playgrounds issued by the Bureau of Parks, Playgrounds, and Bathing Beaches provide that all directors and physical instructors aid in staging on each playground of the city All Hallowe'en programs suitable to the occasion, with stunts, games, frankfurter and marshallow roasts, and a big bonfire; and that the wearing of costumes be encouraged. Grounds are kept open till 10 p.m. The whole child population of Miami Beach, Fla., is encouraged to participate in the annual Hallowe'en Frolic of that community, which is an affair of city-wide interest for days in advance.

These five cities are typical of different methods of celebration such as are staged in many places, all of which are demonstrating anew each year that something amusing to do is the finest antidote for ruthless destruction and lawlessness.

TWO FLOATS FORM THE GLENS FALLS PARADE

Ten Rules for Placing Street-Lighting Units

EFFECTIVENESS of street lighting depends upon the proper placement of the sources of illumination as well as upon their intensity and other related factors. Practice has varied greatly in respect to lamp location, including height, spacing, and position with reference to the post and the two sides of the street. These points have been subject to much study and discussion, notably by the Street-Lighting Committee of the Illumination Engineering Society, which has embodied various recommendations in its statement of "Principles of Street Lighting." *

In the recent book, "Street Lighting Practice," † by Ward Harrison, Director of Engineering, Edison Lamp Works, National Lamp Works of General Electric Co., and a member of the above committee; O. F. Haas, Assistant General Manager, Atlantic Division, National Lamp Works; and Kirk M. Reid, Illuminating Engineer, Edison Lamp Works, National Lamp Works, matters such as glare, pavement brightness, uniformity of illumination, and silhouette, in their relation to good street lighting, are discussed in a chapter entitled "Factors Affecting Visibility on the Street," and in a later chapter the following "Practical Rules for the Location of Lighting Units," based upon the preceding considerations, are presented as the authors' recommendations:

1. A 30-foot pavement (curb to curb) should be considered as about the limit for a satisfactory installation of overhead thoroughfare or residence street lighting with units on only one side of the street. Where a permanent installation consisting of ornamental underground lighting equipment is adopted even though the pavement width is less than 30 feet, the small additional cost of staggering the units is a very profitable investment. Most streets of this character are lined with trees and the staggered system avoids long heavy shadows and provides the same amount of illumination on both sidewalks.

2. In thoroughfare and residence street lighting it is noteworthy that even with efficient upright equipment two bracket standards properly located are generally equivalent in illuminating value to three upright standards carrying lamps of the same size. The pendant bracket equipment has a greater output in the lower hemisphere; also the bracket, by bringing the unit over the curb, reduces the apparent width of the pavement, and gives a bright spot of light under the lamp and a path of brightness along the curb which is of great importance in assisting the driver to see by silhouette.

3. Wherever practical, lamps should be placed on the outside of a curve; otherwise, they are directly in the driver's view and he cannot readily see past them. Also, with lamps on the inside of the curve the direction of the light is such that there is no sheen of brightness on the pavement to assist the driver's vision.

4. A staggered system of lighting is not desirable for a boulevard with sharp curves unless the units are very close together and afford a high level of illumination. The staggered system does not indicate the direction of the road nearly as well as do units on only one side or on both sides opposite each other. Where lamps are located on one side of the road only, and it is desirable to cross to the other side with the row of units on account of foliage interference or curves, a pair of units may be located opposite each other at this point to avoid confusion.

5. The center-suspension system of overhead lighting is not, in general, recommended, because it is difficult to maintain under present conditions of traffic, and on wide streets it does not afford maximum visibility by silhouette as the sheen off the pavement does not cover the entire surface but is seen simply as a bright strip at the center of the street.

6. Where ornamental upright units are used, 13 feet should be considered a minimum mounting height even with lamps of small size. Where 2,500- or 4,000-lumen lamps are used with ornamental pendent bracket equipment, 15 feet should be considered a minimum. Where 6,000- to 15,000-lumen lamps are used for thoroughfare lighting in pendent equipment, 20 feet should be considered a minimum. Where lamps even as small as 2,500 lumens are used on a spacing of 250 feet or over, a mounting height of 20 feet should be considered a minimum.

7. The adherence to a fixed spacing for ornamental equipment on any given street need not be absolutely rigid. If the spacing adopted is 150 feet and this places one unit directly in the foliage of a tree, the unit should be moved one way or the other to clear the branches. With a spacing of 150 feet, if the distance between units varies as much as 20 feet the casual observer will not notice it.

8. A lamp should be placed at the head of a dead-end street to reveal a danger point to the driver and allow him time to stop without overrunning.

9. Street-lighting posts should be located at least 18 inches from the curb in order to clear overhanging truck bodies, automobile bumpers etc.

10. Curbs in the business district are now being built with a rather long arc at the corners in order to facilitate automobile turning. Previously where square corners were used it was possible to locate a unit directly on the corner and it would line accurately with each row of units on the intersecting streets. With the long-radius curbs a unit located right at the corner does not line up with either row of units and also it congests the available cross-walk space. Consequently, the practice now is to locate such a unit on the principal street at the property line. A unit so located usually provides sufficient light for the side street, although if the side street is quite important it is easily possible to bring the first units on the side street closer to the corner, say one-half the regular spacing.

* See The Municipal Index for 1928, page 289.

† Published by McGraw-Hill Book Co. For brief review see THE AMERICAN CITY, August, 1930, page 181.

A Notable Display of Outdoor Lighting

FLOODLIGHTING THE SAN FRANCISCO CIVIC CENTER

During the convention of the National Electric Light Association in San Francisco last summer a special and spectacular floodlighting installation was made at the Civic Center. The equipment was largely loaned by various manufacturers, and is said to be the largest ever assembled on the Pacific Coast for a temporary installation. Four transmission-line towers 100 feet high were erected, and clusters of Crouse-Hinds, General Electric and Westinghouse floodlights mounted on platforms near their tops brightly illuminated the plaza, with its fountains and blooming flower-beds. Many scintillators and searchlights were also used. The City Hall, at the left, the California State Building (right), and also the Library and the Auditorium were individually floodlighted, the last-mentioned having a special treatment of mobile lighting in colors

A Proposal to Improve Condemnation Procedure

By W. C. BERNARD
Municipal and Valuation Engineer, St. Louis, Mo.

At least 95 per cent of all properties required for public use are acquired through the right of eminent domain. The procedure commonly termed "condemnation" is usually divisible into two distinctly different functions. The first, and most important of these from the point of view of public policy, is the manner of determination of damages to be awarded for properties taken or damaged. The second is the assessment of the improvement on the property benefited by it. While authority for this right of assessment springs from the taxing power of the state, and has no connection with the power of eminent domain, early practice led to the determination of damages and benefits by the one tribunal appointed by the court. The fact remains that these two operations with nothing essential in common have become quite closely linked through custom of procedure.

The Two Operations Should Be Separated

The intricacy of the problems arising in the administration of both operations has reached the point where public policy demands their separation. Fair dealing and the Federal Constitution decree that no man shall be deprived of his property except by due process of law. The state laws and logic, borne out by experience, demand that such special benefits as may be shown shall be assessed in accordance with the accepted principles of special assessment, and be measured by the same standard in every instance. Both these operations might be performed by a permanent commission handling all cases, but the possibility of harm through misfeasance is great enough to preclude its use. The practical answer lies in a complete severance of the two operations, so that the determination of damages can proceed expeditiously and concurrently with the assessment of benefits, each according to its own legally established procedure.

Such severance should be made the occasion of a revision of the law to meet present-day requirements. On the assessment side of the case, the chief requirements are: a bureau of special assessments with files and records open to the public for inspection at all times; that the office be in charge of an able, responsible and trained official; that the option be provided for payment of assessments in annual installments up to ten in number; that this office be closely coordinated with the fiscal department of the city; and, most important of all, that a practicable plan be evolved, which will provide adequate funds for the financing of an improvement through to its physical completion, without drain on the city's credit. On the eminent domain side of the case, one of these requirements is, that *specially qualified* freeholders should be appointed as commissioners; another is that both the owners and the city should be given some right of challenge of appointments by the courts, of commissioners; another is that the responsibility for expedition of commissioners' actions should devolve upon the court.

Steps of the Procedure

By way of effecting these recommendations concerning eminent domain, a procedure is recommended patterned to some extent after the St. Louis charter as it is proposed to be changed through amendments drawn and submitted by City Counselor Julius T. Muench and G. William Senn, Condemnation Associate City Counselor.

The first step would be the appointment of a commissioners' venire by the Circuit Court of the judicial district. Three appointees would be named by each judge, one familiar with real estate values and of at least five years' experience in the real estate business; one familiar with current costs and methods of construction, and with at least five years' experience as an architect, engineer, or contractor; and a third with at least five years of business experience in the city. Upon application for appointment of condemnation commissioners, the court would choose by lot from this venire, seven names, at least two from each classification. No commissioners would be eligible for selection on two or more cases concurrently.

A second venire of the same number and appointed at the same time and in the same manner would be available should the first become exhausted by reason of bias, interest, resignation or illness. Members of both venires would be appointed for a period of two years.

Any party in interest would have the right to examine the persons so presented, upon their oath, and thereupon the city, as plaintiff, and the defendants, collectively, would each be permitted to challenge two of the seven so presented, and the remaining three should constitute the commission for the case. They would be immediately sworn by the court. The court would proceed to fix their compensation, set the time and place of their first meeting, and limit the time of their appointment to not more than ninety days in any case. Persons desiring jury trial would be required to make written demand before the appointment of the commissioners. When the verdict of the jury had been secured, the court would certify this to the commissioners for inclusion in their report. The commissioners would assess damages for property for which a jury was not demanded.

The first step would be for the commissioners personally to view the property and give public notice of the time and place at which they would hold hearings. They would hear the evidence submitted by the parties interested, and assess damages and present a sworn report, in which at least two commissioners must concur, to the circuit court. Such report would list the compensation allowed to each owner.

The advantages of such a system over practice in St. Louis and elsewhere are apparent. It would eventually eliminate the vagaries and imbecilities of a common jury. It does not impose a burdensome and unwelcome task on judges who have no particular training for it. It not only insures a reasonable high standard of training and experience but preserves the necessary element of responsibility. Moreover, there is every reason to expect from it an acceleration of time that will be welcome to the citizen and the city.

ACKNOWLEDGMENT.—The foregoing article is an excerpt of a paper on "Acquiring Land for Public Improvements," presented by Mr. Bernard at the 1930 National Conference on City Planning, in Denver. The complete paper will be published in the Proceedings of the Conference to be issued this fall.

State-wide Telephone-Typewriter Police-Alarm System for New Jersey

BEGINNING October 1, it will be possible to broadcast police alarms to any part of New Jersey by telephone-typewriter communication from state headquarters at Trenton and zone headquarters at Newark, Morristown, Freehold and Hammonton. Negotiations are being conducted with the major counties for local connections, which will bring scores of municipalities into touch with the broadcasting and make the "blanketing" of the state still more complete for concentrated police action. New York City and points in Pennsylvania will also be connected, according to the announcement by the Superintendent of State Police, Colonel H. Norman Schwartzkopf. The system was authorized by the 1930 Legislature.

The switchboard at state headquarters, which has complete supervision over all alarms broadcast over any portion of the system, has a capacity of ten circuits. By the operation of the proper switching keys, state headquarters can broadcast over any or all of the circuits extending from the board, that is, to any group of stations or all stations on the one-way circuits (stations in the vicinity of Trenton, which have receiving-only telephone typewriters) or to any or all zone headquarters, connected by two-way circuits. In addition to this selective broadcasting, state headquarters may, by the operation of a timing key, automatically seize all circuits, including those extending from zone headquarters switchboards, for the broadcasting of general alarms, thereby preventing interruption from any zone headquarters.

The Old Swimming Hole Turns Modern in the Interest of Sanitation

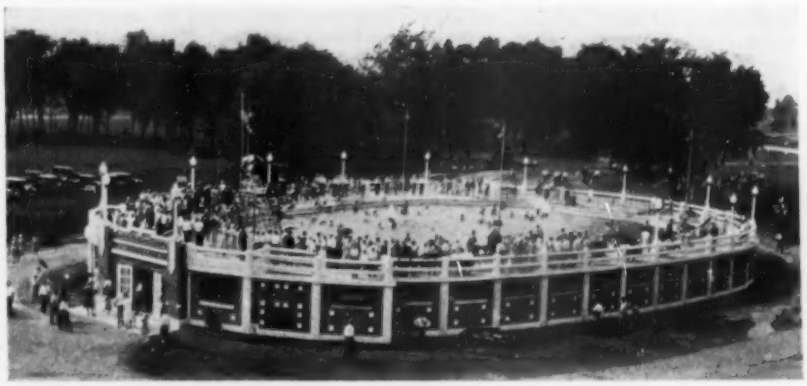
By WESLEY BINTZ
Consulting Engineer; Swimming Pool Designer, Lansing, Mich.

THE "Old Swimmin' Hole" in the Brandywine River, immortalized by James Whitcomb Riley, thick-clustered with old and romantic associations, but alas, long known to be unsanitary to the point of definite danger to bathers, has given place to a modern swimming pool, representing the most efficient and progressive ideas in architecture, construction, operation, and sanitation. Five years ago when a Municipal Park Board was put in operation in Greenfield, Ind., the Riley Memorial Park, through which the Brandywine flows, became its principal responsibility, and the matter of a modern swimming pool was given consideration. It was not, however, until December, 1929, that the matter was brought to a definite head by the present Park Board, which consists of Herbert Monger, President; G. B. Davis, J. L. Allen, M. D., W. W. McCole, and W. R. Dudding. The Board, on that date, commissioned the present writer to prepare plans and specifications for an ordinary sunken pool, which plans and specifications were later changed to cover a Bintz swimming pool, 80 by 120 feet, ovoid, to accommodate 500 bathers, and to cost not over $25,000.

WHERE THEY USED TO SWIM IN GREENFIELD

The pool, developed accordingly, was officially opened with appropriate dedication ceremonies on July 4, this year. The entrance to the pool, which is illustrated, opens upon a spacious, well-lighted entrance room and office. Men swimmers pass to the right and women to the left, while spectators pass directly to the concourse floor by one of the two stairways flanking the entrance. On the men's side is a large dressing room, exceptionally well lighted and ventilated, with benches, showers, and a counter for checking clothes (lockers not being provided within the cost limit). To the rear of this room are toilets and lavatories. The bather passes to the concourse floor through a foot bath. The women's room is the same size as the men's, that is, 14 by 100 feet. Here there are nicely curtained dressing rooms and showers. A counter is connected with the checking office, there is an adequate sanitary system, and, like the men bathers, the women pass through a foot bath. There is a continuous floor drain throughout the bath-room area.

At the rear of the bath house there are public toilets for men and women, and a women's rest room. At the extreme rear of the pool is a space for the installation of sterilization, purification, and recirculation equipment and electric control. The filter plant is an 18,000-gallon-per-hour plant effecting a complete change of the pool water in less than 15 hours. To keep down expense, only two of the three filters were installed, but all piping, pumps, and motor-power were provided for installation of the third filter at any time. It is interesting to note the efficacy of the filter system. The pool looked almost like a mudhole after being filled with city water, which has a heavy iron content. It was impossible to see the bottom of the pool at the 3-foot end. But after the filter plant had been running for 24 hours, the water was as clear as crystal and the bottom was perfectly visible at the 9-foot end.



WHERE THEY SWIM NOW

THE CHILDREN'S CORNER

On the concourse floor is the little children's wading pool. It is about 12 by 25 feet, and ranges from 6 to 12 inches in depth. As shown in the illustration, it is completely enclosed for safety. The pool proper, enclosed by the concourse, is 80 by 120 feet, ovoid. The ends are squared off and have a width of 36 feet, this permitting seven swim lanes of 5 feet each, with a length of 40 yards. The pool volume is 256,000 gallons. There are sections for both bathers and spectators on the concourse floor.

CHECK ROOM AND COUNTER
An interior view of a typical swimming pool of Bintz design

The concrete pool wall forms one side of the bath room, and the concourse floor around the pool forms the ceiling (in accordance with the Bintz patent). The bath area has a concrete floor. The outside walls are of brick, with limestone window trim and steel sashes. Railing and lamp-posts are of concrete.

And what was the cost? The writer had been instructed that the figure was to be kept below $25,000. Upon adding up all of our contracts, including equipment, plumbing, lighting, painting, purification system, etc., and the engineering commission, we found that we had missed this figure by $96. The Park Board then indicated that it had two or three thousand dollars actually to spend on the pool, and it was then that the writer suggested the present panel brick exterior walls and concrete railing instead of the wooden construction figured in the original bid.

Selling—Not Merely Offering—Municipal Bonds

By GAYLORD C. CUMMIN
Civic Consultant

A SURPRISINGLY large number of municipalities do not sell their securities; they offer them for sale, which is quite a different thing.

This somewhat cryptic statement simply means that the sale is advertised and then the officials sit back, saying, in effect, "Here they are. Take them or leave them." There is little effort to make the securities attractive to investors, and yet their attractiveness fixes the price that they bring. This condition seems to be due to ignorance or carelessness, resulting especially in failure to furnish proper information with an issue of securities and failure to furnish financial information when it is requested.

What Makes Better Prices

The price of municipal securities is fixed primarily by the demand as compared with the supply. Thus, the larger the investing power that is satisfied to purchase the securities of a given community, the higher will be the price they bring. Investors are always endeavoring to get the highest yield consistent with the standard of safety that their judgment approves. In some cases, another factor important with the investor is the ease of resale if it becomes necessary to realize on his holdings. If a community can convince additional investors that its securities conform to their standards, it will get better prices, owing not only to the larger demand but also to the greater ease of resale. It is certainly worth while for municipalities to make every effort to attain this result. Translated into figures, even small improvements in price are shown to be clearly worth while. If 4½-per-cents can be sold on a 4.40 basis, it means a saving of 1.32 per cent of the face of the issue if the term is 20 years; 1.66 per cent if the term is 30 years; and 1.87 per cent if it is 40 years.

What can municipalities do to add to the number of investors who will be willing to purchase their securities?

The investor was satisfied for many years with a statement of the assessed valuation and the net debt, but recent defaults and other financial difficulties that have affected the value of municipal securities have shown the inadequacy of such information to disclose the real condition. A study of the causes of the various defaults that have occurred explains fully why the traditional statement fails to indicate approaching trouble or to give a reliable guide to the financial status of the community. Something better is needed, and an increasing number of investors are realizing this fact.

The Kind of Statement Needed

The first step that a municipality can take to meet this situation is to prepare a statement that covers all the facts pertinent to its financial situation and furnish this statement with its offering. The statement should include data on the economic trend of the community, its operating condition, revenue collection, assessed valuation, tax burden, debt burden, purpose and term of outstanding issues, provisions for payment, including the adequacy of sinking-funds, and the provisions made for insuring the safety of public funds deposited in banks. This is something that is practically never done, but it would be of very great value if complete and authoritative.

It seems quite surprising that many state, county and city treasurers neglect or refuse to furnish pertinent financial information about their community to bona-fide inquirers. Several years ago, I made a critical analysis of state debts for a large group of investors. Much to my surprise, I was unable to get any financial information from eight states in spite of repeated requests of their treasurers and final letters to their governors. Four more states furnished very sketchy and unsatisfactory information. State banking departments, which pass on the legality of securities as investments for savings banks, report the same trouble. The savings banks as a group are the most important investors in municipal securities and yet there are many public officials who by mere neglect to furnish information are eliminating this great reservoir of investment funds from even consideration of their securities. Many investors rely to a large extent upon investment manuals for their information, and yet the publishers of these manuals have great difficulty in getting even the simplest financial information from many municipalities. Investment bankers—the immediate buyers—report the same difficulty.

An Expensive Neglect

There seems to be no good reason for this situation. The public officers concerned are certainly failing in their duty to their people by not exerting themselves to answer such requests for information promptly and fully. A treasurer's neglect of this simple duty may easily cost his constituents several times his salary.

Because there has been recent trouble with some municipal securities, the investor is going to increasingly demand more complete information on municipal securities than he can secure at present. It behooves public officials to make every effort to meet this demand. The wise municipilaity will make a real effort to "sell" its securities by catering to this need for information by every means in its power. All it needs is a little intelligent action.

Is Prison Labor on Highway Work Economical?

A Study Made Possible by the Cooperation of the Highway Departments and Prison Commissioners of the 48 States

IN a survey covering the use of state prisoners on state and county highway work, recently conducted by THE AMERICAN CITY, replies were received from the 48 states. Twenty-eight of these report definitely that their constitutions or statutes permit the use of prison labor in highway construction, and 16 others imply this permission, by some statement as to such practice. Six of the states have no legal authority to use prisoners in this way, although in one of the six—Indiana—the prisoners on the State Penal Farm have been used by the Farm officials for a small amount of work on one or two state roads adjacent to the Farm.

In 16 states prisoners have been used recently on highway work; in 19 others whose constitutions or statutes permit this work, none has been done for several years. Six states make a definite statement that the work or the results have been unsatisfactory; and two of these and two others say that the plan was uneconomical. In Montana and Ohio there has been considerable opposition to the use of prisoners in competition with free labor. Only short-term convicts are reported as used on highway work, which results in frequent changes in the personnel of the gangs. The Public Acts of Connecticut allow any prisoner "other than a person serving a life sentence" to do this work.

Most of the work is restricted to that on state highways. In Maryland private contractors may obtain such laborers; where the prisoner is returned daily to the institution, the pay is $2.10, and if he is kept in a camp, $1.65, the contractor both feeding and housing the men. Ten of the states report that money is paid to the prisoners. This gives an incentive, whether the money is held till the prisoner's sentence expires, or is paid to his dependents. West Virginia reports a tendency to use more of this class of labor to relieve congestion at the penitentiary.

Alabama

The state constitution of Alabama does not permit the use of state prisoners for state and county highway work, but the codes do. The prisoners are not paid a regular wage, but are paid a small amount for overtime work. In 1928 and 1929, the approximate number of prisoners employed on state highway work was 1,400, this number having been increased to 1,600 in 1930.

Arizona

Arizona's state constitution permits the use of prison labor on state and county highway work when appropriations are made for specific purposes. Prison labor was employed in 1929 on a very small amount of work.

Arkansas

The state constitution does not permit the use of prisoners for highway work.

California

The use of state prisoners is permitted by the state constitution of California, the men being paid $2.10 per day gross by the state when on state work. Of this amount, the actual cost of camp operation is retained by the state. In 1928, 433 men were employed in this work; in 1929, 652 prisoners worked on the state highways, and during the first quarter of 1930, 603 men were so employed.

Colorado

Under the state constitution of Colorado the use of prison labor on state and county highway work is permitted, the men drawing no pay other than subsistence and housing, which is paid by the state out of state project funds. No prisoners were so employed during 1928, 1929 or 1930.

Connecticut

Section 1469 of the General Statutes of Connecticut permits the use of prisoners on state road work. This chapter reads as follows:

"Section 1. The warden of the state's prison, the superintendent of the state reformatory or the sheriff of any county, upon requisition of the state highway commissioner, may permit any inmate of either of said institutions, other than a person serving a life sentence, to be employed in the construction of any highway or bridge, under the direction of said commissioner. Said warden or superintendent or such sheriff shall furnish necessary guards over any prisoners while out of the custody of such institution."

This class of labor has not been used in Connecticut since August, 1916, when a concrete road 3,200 feet long was built. At that time the laborers were paid by the State Highway Department.

Delaware

Prisoners have not been employed on state highway work in Delaware during the past three years.

Florida

Under the state constitution of Florida prisoners may be employed on state and county highway work. The men are not paid for this work, except for food and clothing and other care. About 900 men were used on state highway work in 1928, 960 were so employed in 1929, and 980 in 1930.

Georgia

The state statutes of Georgia make it discretionary with the State Prison Commission as to the employment of prisoners on state highway work. The prisoners receive no pay. In 1928, 6,212 prisoners were used on this work.

Idaho

The use of prison labor on highway work is permitted by the Idaho state constitution, but it is not practiced, except to some slight extent by counties.

Illinois

Convict labor has not been employed on state highway work in Illinois for many years. However, the law gives the State Highway Department authority to ship crushed stone from the state penitentiaries at Joliet and Menard for township and state highway work. This material is prepared by convict labor at the penitentiaries under the supervision of the Department of Public Welfare and is furnished free of cost, with the exception of transportation charges. The Department does not expect to use convict labor in the construction of highways in the immediate future.

Indiana

The State Highway Commission of Indiana has no authority for the use of prisoners on highway work, except that certain of the prisoners

What Is "Economical"?— Is Money the Only Thing Worth Saving?

Do not fail to consider the question of prison labor on highways in the light of the illuminating reports from Michigan, New York and Rhode Island, in which practical wisdom and human understanding seem combined. Michigan considers that the system has worked out very well. New York plans to use more prisoners on this class of work in 1930 than in former years. (Read how Warden Lawes of Sing Sing selected with great care 34 honor men for highway work in a suburb of Syracuse this spring.) Rhode Island analyzes the problem on the basis of its own experience, but with no lack of recognition of the high possibilities in the system.

The National Committee on Prisons and Prison Labor favors the employment of carefully selected prisoners in road work, but holds three factors necessary to the success of this work:

1. The prisoner must be given a thorough examination, both physical and mental, in order to determine that he is physically fit for this heavy work and of such mentality that he can safely be trusted.

2. Sympathy and cooperation must exist between the prison authority and the highway authority. Maintenance and discipline of prisoners must be under control of the highway department, which must return the men to prison authorities when they require discipline.

3. The road camp must have as good equipment as that of the private contractor.

on the State Penal Farm have been used by the Farm officials in doing a small amount of betterment work on one or two of the state roads which are immediately adjacent to the Penal Farm.

Iowa

Prisoners are not used on highway construction work in Iowa. A few years ago some attempts were made to use prisoners, but this system of highway construction has not proved either economical or satisfactory under existing conditions. The use of prison labor has consequently been abandoned and there is no movement under way to revive the practice.

Kansas

The statutes of Kansas make provision for the use of convicts on the county roads of the state, outlining the manner of so doing.

Kentucky

There is a law on the statute books of Kentucky permitting the use of state convicts on state highway construction work, the constitutionality of which has never been questioned in the courts. The law provides that the State Highway Commission shall pay the State Board of Charities and Corrections $2 per day for the use of convicts, and that the Board of Charities and Corrections shall house, feed and guard the prisoners. The prisoners receive 50 cents per day out of the $2. The Highway Commission has not taken advantage of the provisions of this law, with one exception, in the past three years, when a rock quarry was operated with about 35 convicts for a period of three months.

Several years ago the Department had several convict camps doing grading work in various counties, but the work proved so unsatisfactory and expensive that it was abandoned.

Louisiana

In Louisiana, the state constitution permits the use of prisoners on state road work, about 400 having been so employed during 1929 and 1930. The prisoners are not paid.

Maine

The laws of Maine provide that the Board of Prison Commissioners may authorize the employment of state prisoners who are sentenced to less than life terms in the construction of highways under such arrangements as may be made by the State Highway Commission, or in the case of other public works under such arrangements as may be made by the authorities having charge. The same arrangements may also be made with the County Commissioners for the employment of county prisoners.

The State Highway Commission has used very little of this class of labor. On the construction of a road in Rockport, arrangements were made with the Prison Commission for the employment of prisoners on this road in 1926, and the arrangements were also carried out again in 1927. In this case the Highway Commission allowed $1.75 for each man per day, and this amount was paid to the State Prison to partially cover the cost of feeding, housing and guarding the prisoners, no pay being given to the men.

Maryland

Maryland has been using prison labor on road work for a number of years, the average number of men used being about 200 daily during the summer months. The Board of Welfare enters into a contract with the State Roads Department and private contractors. Where the prisoner is returned daily to the institution, the pay is $2.10, while if he is kept in camps, the pay is $1.65, the contractor both feeding and housing the men. The prisoner receives 50 cents per 8-hour day and all overtime.

Massachusetts

The General Laws of Massachusetts permit the use of prisoners by the County Commissioners in cooperation with the Division of Highways of the Department of Public Works, on any highway. These laws authorize the Commissioner of Correction to make arrangements with officials of the Commonwealth and of towns to employ prisoners on "any unimproved land." More than ten years ago prisoners were used to build certain roads, but during recent years they have not been so used.

Michigan

Inmate labor in Michigan is used only on projects constructed by the State Highway Department forces. Inmates for this work are secured from only two of the state institutions—Ionia, where the younger and less serious criminals are kept, and Jackson Prison, where the older and medium-serious criminals are kept. These institutions construct and provide camps for their inmates on road work, transport the men, and feed, guard and clothe them. They are delivered to the job each morning and taken back to the camp each night by the prison authorities. They are under the control of the highway foreman only while actively engaged in construction work.

The State Highway Department pays the prisons 30 cents per hour for each hour of productive work performed on construction work, nothing being allowed for the inmates necessary on camp work.

When the prisoners are first approved for road work, their records are carefully scrutinized and their record of conduct in the prison carefully gone over. Only such inmates as have behaved themselves in the prisons are temporarily paroled out for highway construction. They are given this temporary parole because, if this parole is broken, an addition to the regular sentence may be given as a punishment for breaking parole.

When prisoners are first put out on construction work, they are paid about 5 cents per hour by the prison. As they become accustomed to the work and more useful, their rates are increased to a maximum of 10 cents per hour. This increase of rate serves as an inducement to perform the work well. If they refuse to work, they are sent back to the prison. The allowance is deposited to the inmate's account and, if he has dependents, the money is sent to them from time to time as the deposit grows. If he has no dependents, he receives the total amount credited to him on his dismissal from the institution at the end of his sentence. The balance of the 30 cents per hour allowed for inmate labor is used by the prisons for maintaining camps, transporting, feeding, clothing and guarding.

This system has worked out very well in Michigan. Out of a total of about 1,100 different inmates used on highway construction in 1929, there were few escapes or attempts to escape. The maximum number out at any one time in 1929 was about 900.

A few counties in the state use county prisoners for road work.

Minnesota

Prison labor is not used on road construction in this state.

Mississippi

The state constitution of Mississippi does not permit the use of prisoners on state and county highway work, although some counties use county prisoners for this work.

Missouri

The state laws of Missouri permit the use of prisoners on highway work, but this method has not been found satisfactory, as the same class of work is not possible from the untrained men with poor equipment, that can be obtained from regular contractors making a specialty of road work. One dollar per man is allowed per day by the state, which is reimbursed by the local units, 60 cents of this amount being retained for maintenance of the prisoner. Prisoners are employed in several rock quarries producing crushed stone, which the State Highway Department buys from the Prison Board.

Montana

Montana has not used state prisoners on highway work for a number of years, and it is not expected that the practice will be resumed. The experience of the State Highway Commission in using this type of labor a few years ago was not satisfactory and a considerable amount of opposition to the use of prisoners in competition with free labor has arisen from the labor unions and contractors. This experience in 1922, 1923 and 1924 convinced the Commission that the cost of highway construction work with prisoners is fully as high as by contract.

Nebraska

The constitution of Nebraska and the state statutes permit the use of convict labor, but none has been used for almost ten years.

Nevada

Although the state laws of Nevada permit the use of convicts on construc-

tion, improvement and maintenance of state highways, the State Department of Highways has never made a practice of employing convicts on state work.

New Hampshire

New Hampshire does not use prison labor in connection with highway work, although a number of years ago the State Highway Department built one or two sections of road using labor from the county jails.

The experience of the State Highway Department in using jail labor was not particularly good in that it was unable to get the number of men wanted and most of the sentences are short-term, with the result that the personnel was constantly being changed, making the road construction costs more than with free labor.

New Jersey

There is nothing in the constitution of the state of New Jersey which in any way prohibits the state from using prisoners on road work, but for county or municipal work certain changes would have to be effected in the laws and rules. The state does employ convicts on state highway work under the State Use System, the men being paid for by funds supplied by the state. The average pay per day is 25 to 35 cents, the state maintaining the prisoner in the institution or road camp from which he is working. The state employs approximately 100 men throughout the year.

New Mexico

Although the laws of New Mexico permit the use of state prisoners on highway work, the results obtained from this practice have not been satisfactory and prisoners have not been used since 1926.

New York

The constitution of New York State provides that the Legislature shall furnish occupation and employment for prisoners sentenced to the several state prisons. Under the Correction Law, the Commissioner of Correction may employ or cause to be employed the prisoners confined in the state prisons on the repair, maintenance, construction or improvement of the public highways at any place within the state, outside of an incorporated village or city, upon request or with the consent of the State Superintendent of Public Works.

When engaged on highway work under the jurisdiction of local authorities, the local county or town receiving the benefit of the labor must pay not exceeding $1 per day for each prisoner. Upon the report, at the end of each week, as to the number of days' labor each prisoner has performed, the State Department of Correction renders a bill to the local municipality. The money received in payment for these bills is deposited by the warden of the prison in a banking institute designated by the State Comptroller. The funds are subject to the check of the warden and are available for maintenance, housing, purchasing of food, transportation and guarding of the prisoners and any other necessary expense while engaged in highway work. Any balance remaining in this "prison highway labor fund" eventually finds its way into the State Treasury to be credited to the General Fund.

If the prisoners are engaged in highway work on the system of improved state highways, a direct appropriation is made by the Legislature for the construction of prison camps, maintenance and operation of the camps, maintenance of the prisoners, supervision, guards, etc.

It is proposed to use more prisoners on this class of work during 1930 than in former years.

This spring Warden Lawes of Sing Sing received instructions to transfer 34 trusted prisoners from the prison to a suburb of Syracuse to perform construction work and live out of doors. Preparations were made to move them without the use of handcuffs or leg irons. This was the largest batch of prisoners that ever went out of this prison without being manacled. Ordinarily, if a single prisoner is moved to court or to his home or from prison to prison, he has to carry his half of a set of handcuffs around his wrist.

The 34 honor men were selected with great care. While the average have not over one more year to serve, some have two or three years, but have served the greater proportion of their terms. Only one keeper was assigned to supervise the whole group of prisoners, who lived in a road camp for the summer.

North Carolina

The state laws of North Carolina permit the use of state prisoners for state and county highway work, the State Prison receiving 20 or 25 cents per hour per man, according to the classification. In 1928, 150 men were employed in this kind of work, and in 1929 and 1930, 425 men per year were so employed.

North Dakota

In North Dakota prisoners are permitted to work on roads leading to state institutions, but they are not being used for this work at present.

Ohio

The state of Ohio has attempted the use of prisoners on highway work, but labor organizations have raised such strenuous objections to the practice that there is little hope of using this type of labor. A few trusties are used by the various state departments as carpenters, etc., but do not receive any pay for this work.

Oklahoma

About 90 men per year, all trusties, are employed on highway work in Oklahoma. The state maintains camps and feeds and clothes the men, who do not receive any other pay.

Oregon

State prisoners have never been used on highway work in Oregon, and it is not likely that they will be used for this purpose in the near future.

Pennsylvania

It is reported that statutory law in Pennsylvania provides for the use of prison labor on highways, but that this form of labor has never been used by the state.

Rhode Island

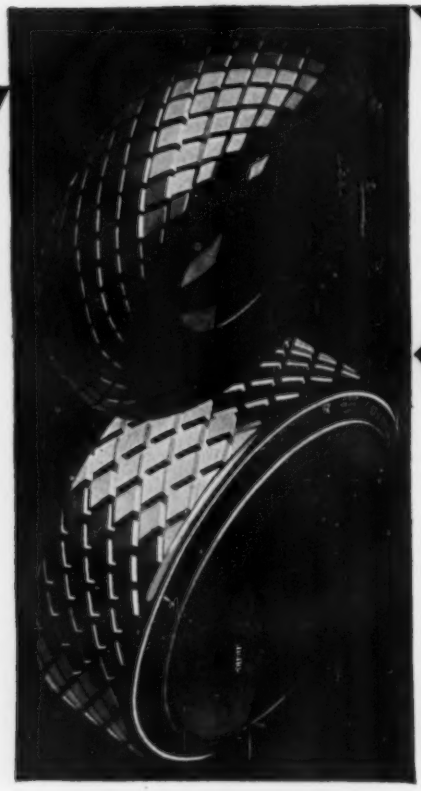
The state statutes of Rhode Island provide for the employment of convict labor in the construction and improvement of state highways. The act was passed in 1917 and during that season the State Board of Public Roads employed convicts on two construction jobs. On the whole, the scheme did not work out satisfactorily and they have not been so employed since.

In its Annual Report covering the 1917 construction season, the State Board of Public Roads makes the following comments:

"We believe in the employment of the wards of the state upon state roads, and we were pleased by the action of the General Assembly in passing legislation making this possible. The moral and physical benefits derived by the convicts from work in the open air are apparent. Convict labor, however, will not bring about such a decided reduction in construction costs as we believe is the popular impression. In addition to the cost of feeding and clothing the convicts, is the cost of guarding, for which no direct return in labor accomplished is received. If a camp is established, there is need for a cook and for several men to work about the camp, and the cost of keeping these men is also an overhead expense for which no return in labor is received. In building the type of roads necessary upon our main trunk lines, furthermore, the cost of labor alone is a relatively small portion of the total cost. Materials and hauling constitute the greater part of the total cost. If, therefore, the cost of labor is reduced 20 or 25 per cent by the employing of convicts, the total cost is, as a rule, not reduced more than from 5 to 10 per cent.

"The efficiency of convict labor may possibly under ideal conditions approximate very closely the efficiency secured from free labor as employed by contractors. The difficulties to be overcome before such efficiency is secured are many. The results secured also may compare favorably with the results secured by free labor, but in this respect also there are many difficulties. We found in our experience during the past year that the chief handicaps to the economical and efficient use of convicts upon state roads were inexperienced labor, frequent changes in the personnel of the gangs, lack of incentives for good work, and the very high rate of allowance for the services of the convicts insisted upon by the Penal and Charitable Commission.

"The larger contracting concerns depend for their success very largely upon the maintaining of an experienced force of laborers. In work done by convict labor an experienced force is almost out of the question. The employment of long-term convicts upon state roads is not deemed advisable, for obvious reasons, and the employment of short-term con-



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If you want to know what truck tires handle each hauling job better, then here is the fact that you should know:

More tons are hauled on Goodyear Tires than on any other kind.

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victs necessarily implies frequent changes in personnel of the gangs. If the allowance for the services of the convicts upon state roads be limited to the actual cost of maintaining the convicts, there seems, from our experience, little question of economy resulting, but, with an allowance of $2.25 per day, straight time for each convict, which was the rate insisted upon by the Penal and Charitable Commission, we can perceive no possibility of economy in construction costs.

"The lack of incentives for good work appeared to be one of the greatest obstacles to the success of convict labor. In order to accomplish good results, it is our belief that each convict must have some incentive to perform his work in a satisfactory manner. This incentive may consist of a money allowance, better food and more freedom than are the rule at the jail, or of reduction in sentence as a reward for good behavior.

"Two sections of road were reconstructed by convict labor during the past year, two separate camps having been established for the convicts employed upon the work. There was a considerable difference in the results secured by the use of the convicts from the two camps. One of the gangs worked very satisfactorily, while the other gang did not. The reason for this difference in the working qualities of the two gangs is difficult to arrive at. The esprit de corps was wholly different in the two camps, and this fact, to our minds, caused the difference in the efficiency of the gangs. The reason for the esprit de corps being so different in the two camps is not to be readily accounted for."

South Carolina

Although the state constitution permits the use of prisoners on state highway work, without pay, they have not been used on this work. There is also a law which permits the county authorities to use on the county highways any prisoner sentenced by the court. All prisoners not needed by the county authorities for county road work are sent to the penitentiary.

South Dakota

There has been some newspaper agitation in South Dakota about putting state prisoners to work on the highways, as permitted by the state constitution, but those who are responsible for highway results do not believe that this type of labor would be efficient.

Tennessee

The state laws of Tennessee permit the use of prisoners on highway work, the state retaining enough of the earnings to pay for maintenance, and the prisoners receiving one-third of the remainder. County prisoners receive nothing from state or county except maintenance.

Texas

No prison labor is used on the state highways of Texas, although such work is permitted under the state laws.

Utah

Prisoners have not been used on state roads in Utah for about ten years. No provision is made for their payment when so employed.

Virginia

Virginia uses about 2,000 prisoners on state highway construction, the state paying all the upkeep of the prisoners, such as food, clothing, buildings, etc., and, in addition, giving each prisoner 10 cents per day.

Vermont

Vermont has not used prison labor in connection with any state work during the past few years. In 1922 and 1924 a few prisoners were used on road-construction projects, the pay being 30 cents per hour. Two-thirds of this amount is retained by the state, the remaining third being retained for the prisoner when his term is ended.

Washington

The state constitution of Washington provides that the State Legislature shall by law provide for the working of convicts for the benefit of the state. Under this provision, convict labor was formerly used in connection with state highway work, but prisoners have not been so employed since 1916.

West Virginia

When the State Road Commission of West Virginia uses prisoners, all costs are paid out of the state road fund. When a county uses them, all costs are paid out of county road funds. The prisoner receives 10 cents a day, and 75 cents a day is paid into penitentiary funds. In addition, the State Road Commission pays all expense of food, clothing, etc. The total of 85 cents is paid to the Board of Control by the State Road Commission or county court, the total expenses per man running to about $2.15 per day. The present tendency is to use more of this class of labor to relieve congestion at the penitentiary. A very small number of men were used in 1928, about 170 in 1929, and approximately 800 will be used in 1930.

Wisconsin

The state statutes of Wisconsin provide that the State Board of Control may employ inmates of the State Prison in the construction and improvement of highways as the Board and the State Highway Commission may determine. Even though the law authorizing the use of prison labor in highway construction has been upon the statutes for many years, the Commission has never exercised its power to use it, the only time prisoners were used for this work being in 1919, on a short stretch of highway leading to the state prison.

Wyoming

Wyoming's constitution permits the employment of state prisoners on highway work. The Highway Department does not use this class of labor.

Are High Land Prices Beneficial?

HIGH land prices, far from being something every city should desire, are in truth, according to Professor Harry Gunnison Brown, an economic and social calamity. In a recent pamphlet, "Tax Relief for Real Estate,"* he deplores the indiscriminate effort to shift the tax burden from real estate to the producer and consumer. He would emphasize the distinction between the community-created value of the site and the individually-created structure. Thus he pictures the present situation:

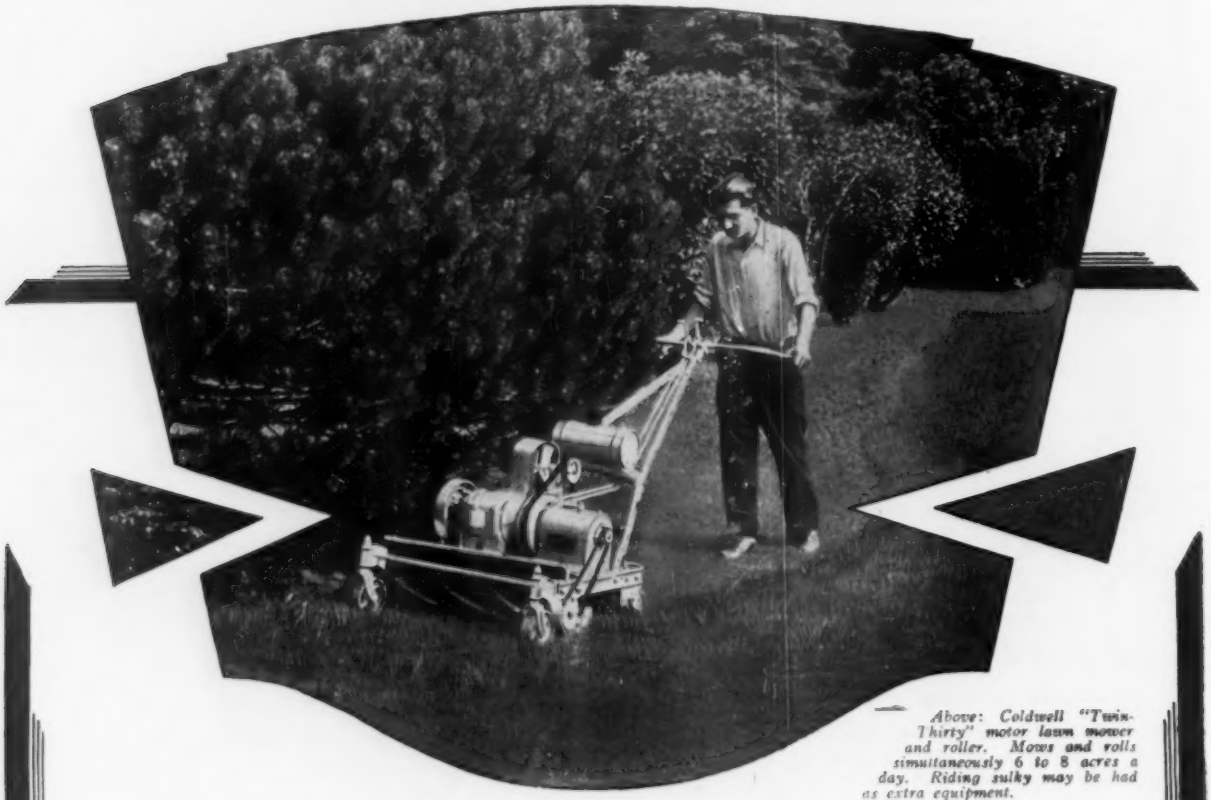
"As the city grows, land becomes more and more valuable. Persons buy land and hold it vacant, waiting for it to rise in value. Thus land is made still more expensive. Thus the poor are compelled to live in even smaller quarters, and thus is home ownership, for the masses, made a yet more impossible ambition. Land becomes so expensive that the people of the city, even in their corporate capacity, feel that they cannot afford to buy sufficient space for parks and playgrounds and school athletic ground, since the city must pay private owners for the very values that the city itself creates. And so the children whom high land values have crowded in their homes are, from the same cause, denied relief outside."

"Some day," he concludes, "there may come into existence, the ideal city, what, from our present conservatively cruel point of view, may seem a dream city, although there are, even now, some remote approximations to it. In that city a tax will take for the benefit of all the people, all or nearly all the rental value of all the land. Improvements brought into existence by the labor and thrift of individuals, will be exempt or nearly so. The necessities and amusements of the poor will not be taxed either directly or indirectly. No one will be able to afford to hold land out of use for speculation. Except for the tax, land will be costless, or nearly costless, for there will be no large privately-received site rent to capitalize into a gigantic sale price. And so the city government can afford, without risking bankruptcy, to fill the city with beautiful and spacious public buildings and with frequent playgrounds and parks. Then we shall have for all, but most importantly for the city's children, the best available substitute for the life in the country and country village enjoyed by a majority of children in the generations which have passed. And these we shall have without sacrificing, but rather while extending those opportunities for education and culture which city life, whatever its evils, has tended to promote."

* Apply to the author, Professor of Economics, University of Missouri, Columbia, Mo.

SINCE 1867

COLDWELL POWER



Above: Coldwell "Twin-Thirty" motor lawn mower and roller. Mows and rolls simultaneously 6 to 8 acres a day. Riding sulky may be had as extra equipment.

Efficient Dependable Economical Lawn Mowing Equipment

COLDWELL Power Lawn Mowers are now equipped with motors designed and built in the Coldwell plant. Both single cylinder and twin cylinder models designed especially for the task they are to perform. If you are not already standardized on this DEPENDABLE lawn mowing and rolling equipment you will want the details.

Write for full details and name of nearest Coldwell agency.

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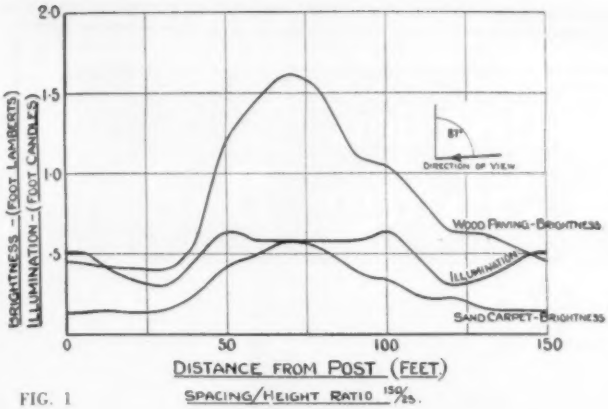


FIG. 1

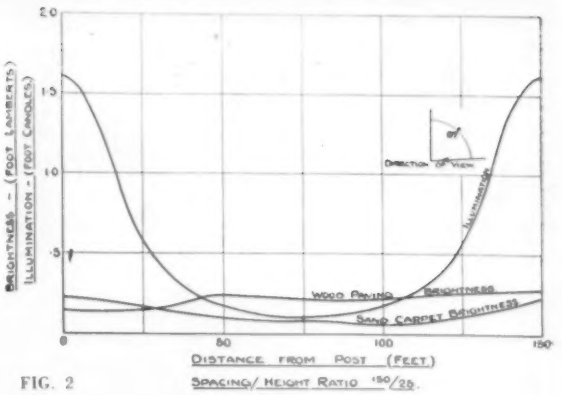


FIG. 2

Measuring Pavement Reflection from Street Lamps

BRIGHTNESS of the street surface at night, as an important consideration in street lighting* excepting where exceptional intensities are used, has been the subject of experiments at the British National Physical Laboratory by A. K. Taylor, who has recently reported thereon in a pamphlet† entitled "Reflection from Road Surfaces," published by the Department of Scientific and Industrial Research.

Samples of four kinds of used road surfacing were obtained, approximately 12 by 24 inches in size, as follows: (1) sand carpet, 13 years' wear; (2) tar macadam, 2 years' wear; (3) rock asphalt, 4 years' wear; (4) wood paving, 15 years' wear. A 3,000-watt, 6,000-cp. lamp was used as the light source, the reflection from which was observed at angles such as occur under practical conditions—chiefly angles of large divergence from the vertical. Measurements of both illumination and brightness were made, the reflection factor was found for various angles of incidence and of view, and the data were indicated graphically by a series of curves. The two graphs reproduced herewith show the results as interpreted in terms of actual street-lighting conditions, giving the variation in brightness on two kinds of surface at various distances from the lamp-post. Figure 1 represents conditions for a lighting unit that concentrates the light in a direction somewhat under the horizontal, thus illuminating the street pavement fairly uniformly from post to post, while in Figure 2 the conditions are those of a lighting unit with uniform distribution in all directions, giving high illumination near the post and little between posts. The following comments are made as to the relative effectiveness of various ways of placing street lamps, from the reflection standpoint:

"It is evident that the greater the number of street-lamps per unit length of roadways, the greater will be the number of bright streaks against which an object may be detected by means of the silhouette effect. It follows that twin lamps, in which the two units are widely separated, or a combination of side and central suspension, is particularly good as regards the multiplication of bright streaks and their distribution over the greater part of the roadway. Such a system will therefore be especially valuable when the road surface is such as to produce narrow streaks of high brightness, e.g., worn wood paving or rock asphalt. Naturally, all road surfaces are of this nature in wet weather.

"It may be remarked that when a road curves, the light sources on the outer edge of the curve are those effective in producing bright streaks of road by means of which traffic and other objects may be picked up.

"Further, lamps mounted on arms which extend for some distance over the roadway produce a better distribution of bright streaks on the road surface than a similar number of lamps mounted directly over the curb."

* See pp. 140-141 of THE AMERICAN CITY for July, 1929, "Nature of Street Surface an Important Element in Street-Lighting Effectiveness," based upon Preston S. Millar's studies; and for airports, see pp. 98-199, October, 1929, "Relation of Paving Materials and Surface Finishes to the Lighting of Airport Runways," by D. C. Young.

† See p. 181 of this issue.

Cut-Throat Electric Rates

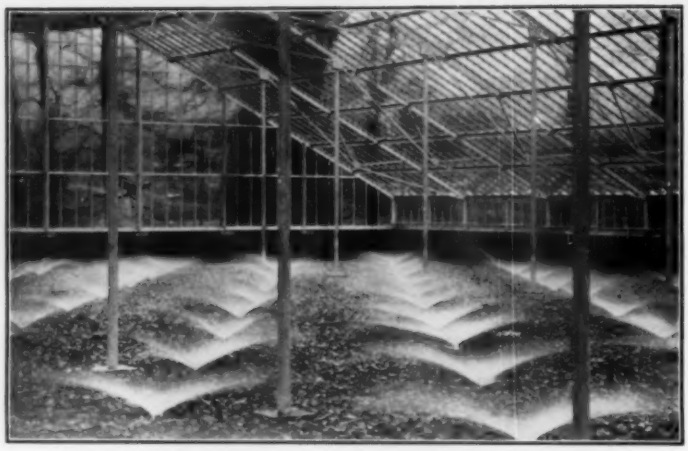
IN connection with the new hydro-electric plant, owned and operated by Crisp County, Georgia, and described on page 147 of this issue, a situation has arisen that may well be of nation-wide interest. The rate schedule under which the electricity generated in the new plant was made available in Cordele, the county seat, was below that in effect for the product of the Georgia Power Co., serving that area. Thereupon the company reduced its rates, not merely to the level of the public enterprise, but to the extent of 50 per cent of the company's former schedule. Various conflicting claims naturally appeared, the county representatives asserting that the public plant was instituted, in part at least, to overcome unfair conditions and exorbitant rates of the private company, and the company charging that the public enterprise was designed to drive the private undertaking out of business, thereby destroying the value of its property. The drastic rate cut made by the company under the plea for justification is naturally interpreted as an attempt to cripple or nullify the public enterprise from the beginning. A third party to the controversy has entered in the shape of the Georgia Public Service Commission, which has issued an order for the company to show cause why the rates which it has established for Cordele should not be put into effect throughout the territory served by the company, which embraces a large part of the state. The company has countered with a temporary injunction against the Commission, from the Fulton County Superior Court, which it will attempt to have made permanent.

The situation in Cordele is somewhat similar to that in Mapleton, Iowa, and in Hartington, Nebr., as described in THE AMERICAN CITY for January, 1928, since which time the supreme courts of the respective states have upheld the contentions of the two cities that the electric companies serving them should not be permitted to cut rates below those prevailing in neighboring cities, in their efforts to destroy municipal enterprises (*Mapleton v. Iowa Public Service Co.*, 223 N.W. 476, and *State v. Interstate Power Co.*, 226 N.W. 427.)

MANAGERS OF MUNICIPAL POWER-PLANTS

AS part of an extensive study of the administration of public enterprises in this country and abroad, under the auspices of the Council for Research in the Social Sciences of Columbia University, New York, a questionnaire has been sent to the managers of municipal electric plants in American cities by Professor Arthur W. Macmahon, in charge of the undertaking, to obtain information relating to the managerial and other personnel of these departments. This study is a valuable, disinterested piece of work, in which it is hoped the plant managers throughout the country will cooperate.

Master Construction Glass-Overs for Sludge Beds



This Sprinkling Filter Glass-Over at Totowa, N. J., is 80 feet wide by 126 feet long

Sprinkling Filter Glass-Overs for Controlling of Odors and Nuisance from Flies

THE Plant at Totowa, N. J., was among the first to glass over a sprinkling filter. This was done with the idea of controlling the odors from this filter, and all vents were screened to control the nuisance resulting from flies. With the Sludge Bed Glass-Over beside it, and in combination with a settling tank, a flow of 400,000 gallons a day can be taken care of.

Both Glass-Overs are made of our Standard Steel Frame Master Construction. All wood used is tank grade cypress.

We have been building glass structures for going on eighty years, and know how they should be built. We have a Department of experts specializing in Glass-Overs for sewage work, to whose services you are welcome.

Lord & Burnham Co.

Sludge Bed Glass-Overs

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Branch Offices: **Boston, Philadelphia, Irvington, Denver, Cleveland, Buffalo, Greensboro, Kansas City, Detroit, St. Louis, Montreal, St. Catharines**

Traffic Regulation in European Cities

To the Editor of THE AMERICAN CITY:

In revisiting England, France and Germany this summer I have been much impressed by the effective way in which street traffic is handled in London, Paris and Berlin. The traffic authorities are men of great ability and show real initiative in making experiments.

Traffic management in England has always been good. There are no traffic lights except those controlled by an officer on the spot who can see the traffic he is trying to regulate. This is also the case in France and Belgium, where they are using red lights with a tinkling bell, as I suggested many years ago. The work in Paris is improving every minute. New crosswalks are marked out nearly every day, and they are steadily extending the work. They have been lighting the center refuges on the Champs Elysees which I persuaded them to install in 1913.

Berlin is already, I think, after only a few years' trial, quite or almost up to London and Paris in traffic regulation, and the thorough manner in which they are going at it means great success for the future. I have never seen greater politeness to civilians than the officers there appear to exercise. The traffic museum in Berlin was a revelation. Nothing of the kind, so far as I know, exists elsewhere. It is significant of the Germans' desire to study traffic from the bottom. There is also a traffic school in the city, open to traffic officers from all parts of Germany. This will of course tend to bring about the standardization of their activities. They have developed two tests—an eye test, and a test of speed of reaction to danger, which are most important.

Accompanied by Police President Karl Zorgubel of Berlin, I visited the Mounted Traffic School, where I found both horses and men beautifully trained, especially as to their hands and legs. When we entered the garden, about thirty of the mounted men were drawn up in two lines facing one another. The officers were firing pistols at tin pans, and men on motorcycles were passing in and out between the horses, making all possible noise to teach the horses so they would not mind anything. The German horses are the best I have seen in any police department since those in New York about 1915.

WM. PHELPS ENO,
Chairman of the Board, Eno Foundation for Highway Traffic Regulation, Inc.; author, "Simplification of Highway Traffic" (Eno Foundation, 1929).

Paris, August 31, 1930.

California County Planning Bodies Organize

THE organization has been completed of what is believed to be the first state association of county planners. It is called The California County Planning Commissioners Association.

The Association holds four meetings a year, each in a different portion of the state. The September meeting was held at Monterey on the 20th, with addresses by the Chairman of the State Highway Commission and the Chairman of the Los Angeles County Regional Planning Commission.

John D. Wright, Chairman of the Santa Barbara County Planning Commission, is President of the Association. Until it is known what funds will be required for the administration of the Association, the dues have been tentatively set at $10 a year for each commission. The officers are not paid, and so far the office work has been done in the offices of the various commissions.

The original law under which county planning commissions were first organized was passed by the California Legislature in 1927. This merely permitted the creation of the commissions by the counties. It was replaced by a new law in 1929 by which the creation of planning commissions by the counties is made mandatory. There are 58 counties in the state, and it is expected that each commission as it is created will affiliate with the state organization.

The California county planning commissions are merely advisory bodies and have no power except as their recommendations are enacted into law by the county supervisors.

When the Association was organized, the question arose as to whether it should be an association of commissions or commissioners. It was decided to make it an association of commissioners, each individual having a vote; but if any member calls for a "roll call" on any vote, the vote is then to be by commissions, one vote for each member commission.

REGIONAL PLANNING CONFERENCE OF A STATE CAPITAL DISTRICT

A SUCCESSFUL Regional Planning Conference was held in Troy, N. Y., on September 18, at which were present official representatives from the cities of Albany, Schenectady, Troy, Rensselaer and Cohoes, and from the village of Menands. All of the Capital District communities which will be affected by the proposed plan were represented except the city of Watervliet, which was unable to participate. It was disclosed that the city of Schenectady has already begun planning along regional lines, and has been making a study of an area of forty square miles. Another conference will be called within a short time by John Boyd Thacher, 2nd, Mayor of Albany, at which a definite plan of permanent organization will be presented.

The Municipal Bond Market

By SANDERS SHANKS, JR., Editor, *The Bond Buyer*

AS of the first of September, municipal bond prices had climbed back to the best level seen since May, 1928. Lower grade bonds, such as the 40 railroads, industrial and public utility issues used in compiling the well-known Dow, Jones bond average, were still several points below the prices prevailing in the spring of 1930, but it is significant that in August and the early part of September the bonds represented by this index spurted ahead rapidly, the sharpest gains being scored by second-grade railroad and utility issues.

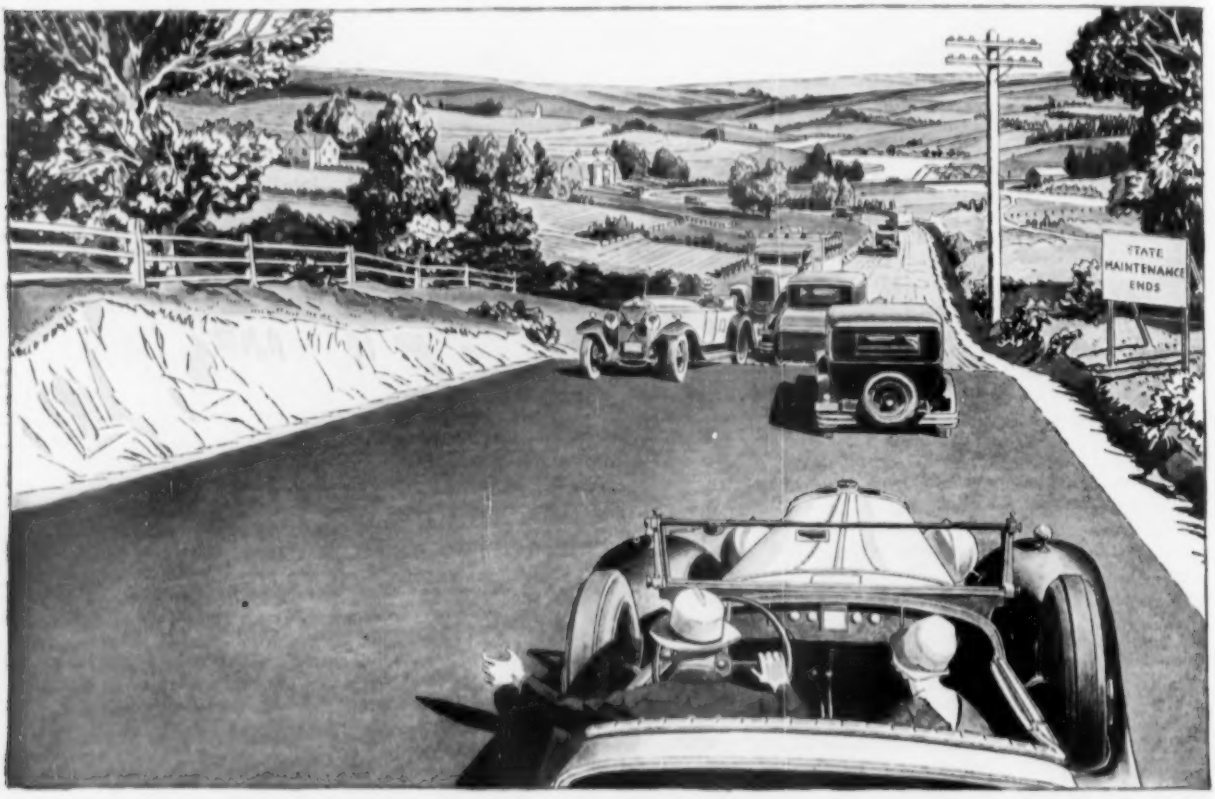
The sharp rise in municipal prices has not been confined exclusively to bonds of the states and the large cities, but such issues have enjoyed a much greater advance than what might be termed second- and third-grade securities. It appears likely that such bonds will now be in greater demand and will sell up more in line with the obligations of the prominent cities than has been the case so far this year.

The municipal market, as a whole, has been favorably influenced by a slump in the output of new issues; a condition which is apt to prevail for some weeks to come. The consensus of opinion among virtually all well-known students of price movements is that a good bond market may be expected for many months to come. It is unlikely, therefore, that state and municipal borrowers will anticipate by more than a normal period of time need for capital funds. Two other influences suggestive of a reduction in the volume of borrowing may be mentioned. One is the reduced cost of construction of public improvements, and the other is opposition on the part of taxpayers who are feeling the pinch of a business depression to the authorization of bond issues for new and not absolutely essential improvements.

The following table, giving the details of recent sales of new issues, will indicate the current level of municipal bond issues:

Amount	Municipality	Rate (%)	Maturity	Net Basis (%)
$800,000	Irvington, N. J.	3½	1-yr.	3.49
3,765,000	Buffalo, N. Y.	4	15 1/3-yr. (avg.)	3.92
230,000	Omaha, Nebr.	4	20-yr.	3.99
42,000	Penn Tp., Pa., Sch. Dist.	4½	1-21-yr. (ser.)	4.08
150,000	Stratford, Conn.	4½	1-15-yr. (ser.)	4.18
2,000,000	Chicago, Ill., West Park Dist.	4½	7-yr. (avg.)	4.19
14,278	Benton Co., Ind.	4½	6½-yr. (avg.)	4.30
2,000,000	New Orleans, La.	4½	33⅝-yr. (avg.)	4.31
34,000	Bucyrus, Ohio	4½	6-yr. (avg.)	4.40
21,000	Stanislaus Co., Calif. Grayson Sch. Dist.	5	8 2/3-yr.. (avg.)	4.59
55,000	Ziebach Co., S. Dak.	5	11½-yr. (avg.)	4.77
50,000	Buncombe Co., N. C., Sch. Dist.	5¼	5-29-yr. (ser.)	4.98
180,000	Sevier Co., Tenn.	5½	20-yr.	5.47

More Road for the same money



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AIRPORTS AND AVIATION

A Monthly Department on Aeronautical Activities of Municipal Interest
Conducted by ARCHIBALD BLACK, President, Black & Bigelow, Inc., Air Transport Engineers

Andree

A 1930 echo of the Andree balloon expedition of 1897 to the North Pole was heard when reports of the discovery of the bodies of Salomon August Andree and his two companions reached civilization. The discovery, it seems, was made purely by accident by a scientific party operating from the sealing vessel "Brattvaag." The Andree expedition left Dane's Island about 33 years ago, using a large hydrogen balloon in an attempt to fly across the North Pole regions, expecting to be carried by favorable wind currents to a landing point on the other side of the Pole near the border of the ice cap. The discovery of the remains of Andree and his companions undoubtedly formed the leading event in aviation within the past several months. Contrary to the opinion somewhat prevalent at present, the Andree expedition was very carefully planned and for its time probably represented more thoroughness than the present-day transatlantic flights. The balloon was well equipped with facilities for returning to civilization in the event of a landing on the way and it seems that only a combination of unfortunate circumstances, starting with being blown off the anticipated course, resulted in the death of these men.

The Flight of the R-100

WITH the recent flight of the R-100, leadership in the rigid airship field, for the first time, passed out of the hands of the Germans. How long it will remain in British hands only time can tell, but the indications are that a keen race for supremacy will be run during the next decade. This airship, which is the largest built in the world to date, completed its first transatlantic crossing on August 1, having made the trip in the elapsed time of 79 hours. The return trip was completed on August 16 in 57 hours. In round figures, the R-100 has a capacity of about 5,000,000 cubic feet in comparison with the Graf Zeppelin, which has a capacity of 3,700,000 cubic feet. Actually, the German ship is slightly longer than the British one, the latter being of considerably larger diameter. The R-100 has passenger facilities resembling those of an ocean liner, including such features as a central salon with stairways to the upper decks. The first portion of the westward trip was uneventful, although toward the end some trouble was encountered with the fabric covering of the fin, recalling a similar experience of the Graf Zeppelin on one of its recent flights. This flight was made as a demonstration of the commercial utility of the airship in transoceanic service and its builders are now endeavoring to finance a $30,000,000 company to establish a line between Great Britain and Canada.

Another Transatlantic Crossing

BY a strange coincidence, the Paris-to-New York flight of Coste and Bellonte followed closely upon the heels of the startling story of the discovery of the remains of the Andree expedition to the North Pole. This flight was completed on September 3 in the flying time of 37 hours and 17 minutes, making the first non-stop flight from Paris to New York, and reversing the order of things as established when Lindbergh landed in Paris somewhat over three years ago. The east-to-west flight, however, presents even more serious hazards than the one made by Lindbergh.

Glenn H. Curtiss and Chance Vought

WITH the passing of Glenn H. Curtiss, aviation lost a man whose name has ranked with that of the Wrights, among the outstanding pioneers of the industry. His interest in aviation dated back to 1906, shortly after the Wrights made their first experimental flights, and its has always seemed deplorable that the names of Curtiss and Wright should have appeared so frequently as opposing parties in patent lawsuits in the pioneer period of the industry. All of those who have been engaged in aviation from the early days have a warm feeling for the constructive work of Glenn Curtiss and the valuable contributions which he made to the development of flying. Curtiss' first venture in aviation was made when he joined the group organized by Alexander Graham Bell and known as the "Aerial Experiment Association," the membership of which included also Lieutenant Selfridge, J. A. D. MacCurdy and "Casey" Baldwin. These men, together, built the first of the airplanes which became known as the "Curtiss type" and which was the beginner of a long line of Curtiss products. Shortly after the outbreak of the World War, the Curtiss Company obtained very substantial orders from the British Government and theirs became the first production aircraft factory in America. The Curtiss companies finally passed out of the hands of Mr. Curtiss through his selling of his interest during the war. From then on, although he always retained some interest in aviation, his part was merely that of an advisor to the company bearing his name, most of his business interests being in Florida real estate. Curtiss was fifty-two years old when he died.

Recent months also witnessed the loss of another pioneer, in the death of Chance Vought, the founder of the company which bears his name and which is now a unit of United Aircraft & Transport Corporation. Chance Vought first became interested in aviation in 1911, and, although formerly a pilot, was best known as engineer and manufacturer. The line of military types designed under his direction served to build up the reputation of the Chance Vought Corporation until it ranked among the leading producers of military aircraft in this country. With the organization of United Aircraft & Transport, Mr. Vought sold his interest to that company.

State Activities

JUDGING by the clippings on state activities which reach this desk from month to month, interest in aviation on the part of state authorities is steadily increasing. George A. Parker, Registrar of Motor Vehicles of the State of Massachusetts, announced on July 25 the promulgation of regulations governing gliders to be used in that state. Gliders are required to be registered with the State Registrar of Motor Vehicles and to conform with requirements of the United States Department of Commerce. In general, the regulations are patterned closely after those of the Federal Government. *The United States Daily* of July 26 carried a report of a statement by Governor Emerson of Wyoming in which the sheriffs of that state were asked to give their cooperation in the enforcement of the air laws.

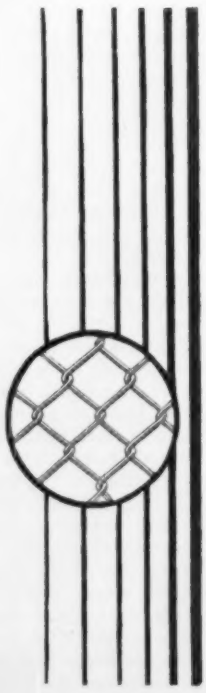
A statement recently issued by the California State Department of Public Health proposed that detention hospitals be placed at airports and that adequate medical services be provided as a safeguard against the introduction of infectious diseases by persons arriving from distant points. This statement pointed out that long voyages by boat or train are now being supplanted rapidly by speedy airplane transportation, thus decreasing the effectiveness of ordinary safeguards against the importation of diseases, as the time required by the longer trip generally makes the presence of such diseases more evident.

The National Conference of Commissioners on Uniform State Laws, held in Chicago in August, voted in favor of uniform state licensing laws to govern the operation of aircraft. State laws would, under this plan, supplement the Federal regulations.

A review of the laws of Ohio as they apply to aviation is the subject of an opinion furnished by Attorney General Gilbert Bettman of that state to State Director of Aeronautics John M. Vorys.

A fence that says "KEEP OUT" *and Means It!*

WHEN danger threatens, there must be no compromise with safety. Pittsburgh Chain-Link Fence provides a positive barrier against adventurers. Built of sturdy, substantial steel wire fabric and strong, tubular steel framework, it is as fine a fence as modern industrial methods can make. It is made completely, from ore to finished product, within our own mills, of special-formula copper-bearing basic open-hearth steel. Amply protected by a heavy, closely-bonded coating of zinc after weaving, Pittsburgh Chain-Link Fence is certain to resist the ravages of time and use. Frame members are of seamless steel tubing, with fittings of heavy malleable iron and pressed steel, providing a rigid and sturdy framework which easily withstands the shocks of everyday use. Pittsburgh Chain-Link Fence will keep its shape and attractive appearance year after year with a minimum of maintenance. It is the ideal enclosure for parks, zoological gardens, playgrounds, athletic fields, school grounds, airports, cemeteries, reservoirs, and municipal works of all kinds. Erection service is always available anywhere. Write to us for descriptive literature.



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A summary of this opinion was carried in *The United States Daily* for July 12.

Aircraft Production and Mileage

THE Aeronautics Branch of the Department of Commerce on August 6 made public its report on airplanes manufactured in the United States within the first six months of 1930. Based upon the record of licenses and indentification marks issued, the Department estimates that a total of 1,325 civil airplanes were built in the first six months. In addition, 359 military types were delivered to the Army and Navy, making the total estimated production for all types 1,684. Of the aircraft manufactured for civil use, 148 were exported. These figures compare very unfavorably with the similar period of 1929, but they indicate that the aviation industry is now "turning the corner" and that the worst has been passed. It is interesting to note that the Department of Commerce figure considerably exceeds the advance estimate made by the Aeronautical Chamber of Commerce of America, mentioned in the August issue, that estimate having been 1,250 complete airplanes, including military and civil types. Some later Department of Commerce reports stated that 6,684 airplanes were licensed and 3,089 identified, making a total of 9,773 recorded as in use on June 30, 1930.

World's Greatest Airline

WITH the consolidation of Pan American Airways and New York, Rio & Buenos Aires Line, announced on August 22, there was brought into existence an operating system totaling about 20,000 miles of airlines. The consolidation of these two systems followed persistent rumors of negotiations which were denied repeatedly and with equal persistence. Before this consolidation, Pan American and its subsidiaries had in operation about 18,000 miles of airways over which regular service was maintained, while "Nyrba," as the New York, Rio & Buenos Aires Line was popularly known, had in operation about 9,500 miles of line. Because of some overlapping, the new system is less than the total of the former separate lines. The consolidated system reaches from Brownsville and Miami in the United States; the lines from Miami extending over the Caribbean Sea and down the east coast of South America to Buenos Aires, while the lines from Brownsville extend through the Central American countries and down the west coast of South America to Santiago. A connecting link between Santiago and Buenos Aires is also operated, in addition to numerous branches interconnecting the lines in Central American countries and across the Caribbean Sea. The new system will have about 134 large transport-type airplanes and is to maintain air mail and passenger service over its system. This consolidation is of particular importance, as it puts under control of United States capital the largest airline in the world and places the United States in the dominant position in South American air transport, completely dwarfing the German and French lines by comparison.

Night Flying as a Public Nuisance

THE extensive amount of night flying which has been carried on over the populated areas of Long Island, New York, in the past two years, has occasioned some opposition on the part of residents whose sleep has been disturbed. In consequence, District Attorney Elvin N. Edwards of Nassau County, N. Y., on July 21 called a conference of the airport managers of that county, warning them that some effort would have to be made to reduce the complaints being received from residents in the proximity of the airports. The outcome of this conference was an agreement on the part of the airport managers to eliminate night flying (as far as practicable) between 11 p.m. and daylight during the summer and between 10 p.m. and daylight during the winter. As some endurance flights were under way over Roosevelt Field while this conference was in session, it was agreed that the pilots of such airplanes would be required to fly at not less than 1,500 feet during the hours of darkness specified.

Some Useful Publications

A MOST useful handbook on culvert and drainage practices has been issued by the Armco Culvert Manufacturers Association, Middletown, Ohio. Covering the whole subject of drainage in a comprehensive manner, it also devotes a special chapter to the drainage of airports.

Two interesting booklets on airport runway construction have been recently issued. One by The Asphalt Institute covers the subject of asphalt runways, while the other, on concrete runways, is published by the Portland Cement Association. City engineers and airport managers will find both of interest.

Department of Commerce Activities

AMONG the recent publications of the Department of Commerce, Aeronautics Branch, are Bulletins No. 7-B on Parachutes and No. 22 on Gliders. The Department recently announced a modification of the regulations governing the operation of flying schools, under which modification schools are now permitted to accept students without being obliged to graduate them within any definite time limit. New regulations have been issued covering aeronautical lights, and color characteristics are required to conform to a uniform standard so that each light may give an unmistakable indication as to whether it marks an airport, a route leading to an airport, or merely a point from which bearings may be taken.

Evidence of the recent efforts of the Department to apply its regulations with greater rigidity are reflected in the substantial increase in violations of air commerce regulations charged against pilots during the second quarter of 1930. Violations of these regulations dealing with acrobatic or dangerous flying headed the list of specific offenses. Other violations included flying without license, flying without navigation lights, and flying without identification numbering. The total number of violations, 177, compared with the total of 122 for the first quarter of the year.

Work on the first of twenty new radio communication stations which are to be built during the current fiscal year will have been started by the time this paragraph appears. The additional stations will be located at Du Bois and Great Falls on the Salt Lake City-Great Falls route; at Yuma, Tucson, El Paso, Wink, Sweetwater, Shreveport, Jackson and Birmingham, on the southern transcontinental airway between San Diego and Birmingham; at Pittsburgh on the St. Louis-New York airline; at Little Rock, Memphis and Nashville on the projected Fort Worth-Nashville route; and at Las Vegas and Milford on the Los Angeles-Salt Lake City airway.

Army Curtails Participation in Airport Openings

THE many calls upon the Army Air Corps for cooperation and participation in airport opening celebrations has made it necessary for Assistant Secretary F. Trubee Davison to curtail this activity. Consequently, the announcement was recently made that Air Corps airplanes would no longer participate in municipal airport dedications in cities of less than 50,000 population. Mr. Davison stated that he regretted taking this step but that airport dedications had become so numerous that the Army found itself unable to meet the demands for airplanes and pilots for exhibition flights. "If we did not put a brake on this activity," he said, "the military usefulness of our pilots would be impaired and the Air Corps would be transformed into a flying circus."

Two Airport Articles

THE new terminal station recently completed on the airport at Hamburg, Germany, is of very striking architectural design, following the modern school as interpreted in that country. *The Architectural Forum* in its July issue carries a very complete description of the building, illustrated by several excellent photographs and some very complete floor plans.

An interesting article by Richard J. Neutra appeared in *The Architectural Record* for August under the title of "Terminals?—Transfer." The author takes issue with applications of the word "terminal" in describing an airport and points out that airports are really transfer stations. He describes interesting and carefully worked out plans of what might be described as an airport of the future. Here the utility as a transfer point is fully recognized and every facility for rapid transfer from plane to rail or road is provided.

Pave and Save with ASPHALT

The Southern Artery, Boston, Mass. New heavy traffic by-pass on principal route to South Shore and Cape Cod. Penetration Asphalt Macadam 40 feet wide.

IN Massachusetts, where severe climatic conditions plus rapidly-increasing heavy traffic would logically bring increasing road depreciation, maintenance costs of asphalt macadam and asphaltic concrete have actually *decreased* from year to year.

In 1927 the maintenance cost for 7,287,904 square yards of asphalt macadam there was 2¢ per square yard; in 1928 this decreased to 1.6¢; in 1929 to 1.4¢. Similarly for 2,749,951 square yards of asphaltic concrete, the decreasing maintenance figures were: Per square yard, 1.3¢ in 1927; 1.2¢ in 1928 and only 0.9¢ in 1929.

The foregoing maintenance figures not only show a decrease from year to year but they are also the *lowest* for all types of roads in the Massachusetts State Highway System.

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THE TAXPAYER'S DOLLAR

A Monthly Department of Budgeting, Assessment, Taxation, Accounting and Other Phases of Municipal Finance Conducted by A. E. BUCK, National Institute of Public Administration, New York

Monthly Payment of Taxes on Real Estate Recommended

THE Committee on Public Relations of the United States Building and Loan League, of which Henry S. Rosenthal, of Cincinnati, is Chairman, has recently recommended that taxes on real estate be paid on a monthly basis instead of semi-annually or annually as is now the custom. It is argued that the burden of taxes would not be noticed so much if met each month. Taxes would then be in the same class with gas, electric, and telephone charges, and could be easily anticipated. The monthly payment of taxes, it is stated, would keep money constantly flowing into the treasury of the city or other local government and thus obviate temporary borrowing.

While this proposal for the monthly payment of taxes is attractive, there is some doubt as to its feasibility. It would be easy enough to adjust the financial machinery of city governments so as to send out monthly tax bills. The principal difficulty, it seems, would arise from not starting the collection of taxes until several months after the beginning of the fiscal year, a situation which exists in many cities. The adjustment of this situation would require, in a great many cases, not only charter changes but revision of state laws.

Los Angeles Budget Document Interesting

THE Los Angeles budget document for the current fiscal year is worthy of examination by all city budget makers. The most interesting feature of this document is Mayor John C. Porter's budget message. In making his budgetary recommendations, he has taken into account not only governmental affairs but also the economic, industrial, and social conditions of the community in so far as they affect the financing of the city. Such approach needs greater emphasis in all public budgeting. The message is frank and without rhetorical flourishes. Financial conditions are briefly discussed and recommendations made on policies.

Director Roy A. Knox of the Bureau of Budget and Efficiency is responsible for the mechanical part of the preparation of the Los Angeles budget. Mr. Knox follows the provisions of the city charter in setting up this document. Since these provisions are rather detailed, he is hampered in certain respects in presenting the budget in the most approved manner. This often happens when detailed procedure is written into the city charter. Laws, unless quite general in their provisions, do not keep pace with the rapid developments in budgetary technique.

Schenectady Has Delinquent Tax Problem

RECOMMENDATIONS for improving the delinquent tax situation in Schenectady, N. Y., were recently made by Albert H. Hall, Managing Director of the local Bureau of Municipal Research. Mr. Hall proposes that the delinquent period should not extend beyond the year in which the taxes are due. Under the present practice, tax liens cannot be sold until seven months after the second installment is due. He recommends that authority be given the Treasurer to hold tax sales for delinquent special assessments as they become due and payable without having to secure the consent of the Council. He claims that the penalty for non-payment of taxes and special assessments is too low, the interest charge being three-quarters of one per cent a month on delinquent taxes and one per cent a month on delinquent special assessments. White Plains, with penalties ranging from 6 to 14 per cent and advancing each month, is cited in support of an increase.

Delinquent properties in Schenectady are bid in on the basis of the least number of years for which the bidder is willing to hold them. Mr. Hall thinks that the bidding should be on the basis of the interest to be charged against the original owner during the time the property is held by the purchaser. If this procedure is adopted, he believes the period of redemption should be two

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AND THE CHAPERONES ARE UNDER THE TREES, SOUND ASLEEP

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years instead of one year, as is now the practice. He advocates the consolidation of all existing municipal liens in one tax sale.

Mr. Hall concludes his recommendations by saying that "by adopting the optional ordinance provided for in the new state law, Schenectady would have the power to foreclose and give clear title. This is the crux of the whole matter and will provide immediate relief. At the present time the quit-claim deed, with its uncertainties, fails to attract purchasers, and as a consequence the municipality takes over the property, wiping it off the books as assessable land and placing a heavier burden on the faithful taxpayer."

Detroit's Budget for 1930-31 Shows Increase

THE Detroit Bureau of Governmental Research has again made a valuable summary of that city's budget for 1930-31, which is published in the Bureau's periodical called *Public Business* for July 15, 1930. This summary covers only 22 pages, including a chart of the city organization, and is most illuminating from the citizens' standpoint. It presents the essence of a 200-page budget document, containing approximately 3,600 items. It sets forth a list of some 200 public functions which are being performed for a city population of 1,500,000 through the efforts of 41,000 employees in 31 departments.

The Detroit budget for the fiscal year beginning July 1, 1930, totals $160,094,848.40, which is seven and a quarter millions more than the budget of the previous year. It is financed as follows: $76,000,000 from taxes on general property; $30,000,000 from the sale of bonds, and the remainder from car fares, water rates, fines, permits, etc., supplemented by $6,500,000 from the state for school purposes. The total valuation of city property has increased $93,000,000 during the year, thus enabling the tax rate to be reduced fifty cents on the thousand dollars so that the rate for the current year is $20.15.

During the early part of this year a Citizens Committee on Finances proposed to the Mayor and Council that the tax budget be not increased; that salaries remain the same; that capital expenditures await the adoption of a long-term improvement program; that automobile maintenance be studied; that deficits be avoided, and so forth. The Bureau says that a careful study reveals that further improvements in procedure should be made—the Mayor should have more time for reviewing the budget, the Budget Bureau should be given wider power, and the Board of Education should have its budgeting subjected to greater control by the city officials.

Poor Financial Reporting in Kansas City

THE Kansas City Public Service Institute criticizes the latest annual report of the city Director of Finance. It enumerates a number of inaccuracies, such as reporting the general fund expenditures at a quarter of a million less than they actually were. In conclusion it makes the following observations: "Financial proceedings in accounting, budgeting and reporting have been very much improved during the past four years. There has, however, been little progress in financial policy in the past two years, and last year showed a retrogression. There is room for much improvement, but this can come only when officials show a desire for it. Good financial policy and procedure are no more automatic than any other city activity."

Political Juggling Indicated in Philadelphia's Tax Rate

THE Philadelphia Bureau of Municipal Research recently stated in its folder called *Citizens' Business* that the city tax rate for the current year had been unduly reduced. It was fixed by the Council at $1.80 as against $1.95 in 1929, a reduction of 15 cents. Early in this year it became evident that the tax rate should have been increased rather than decreased. In fact, the city government required more money to meet the expenditure requirements of 1930 and the deficit of 1929 than it would have received from a tax of $1.95. The indications are that the current year will end with a deficit of about $7,500,000. This will require 25 cents more than the present rate to end the year with a clean slate.

The Bureau is of the opinion that next year's expenditure requirements will be much greater than this year. In fact, it thinks an increase of 40 cents in the present tax rate will be required unless "heroic measures" are taken.

Delinquent Taxes Pile Up in Boston

IN its recently published report the Finance Commission of the city of Boston calls attention to the fact that the city government is now in possession of a large number of tax deeds purchased at tax sales. Some of these deeds are on large income-producing properties. The taxes due on these properties for the years 1910 to and including 1925 amounted to $221,000 in round figures. Additional interest is now due which amounts to many thousands more. Specific cases are cited in which persons have been enjoying their properties in Boston for many years without the payment of taxes, the conclusion of the Commission being that these persons have been "exempted from taxation because of political influence."

The Finance Commission states that under the law the Tax Collector has three remedies: (1) he may arrest the delinquent tax debtor; (2) he may sue the debtor in a civil action three months after the tax is payable; or (3) he may sell the property for the amount of the tax. That city official has not used the first two methods, but has relied entirely upon sale. Once the sale has been made and the city has acquired the tax title, the owner is thereafter undisturbed. The money due the city for tax deeds prior to 1927 can be collected by the City Collector only through arrest or suit, or by foreclosing the tax titles. The Collector complains that he gets no cooperation from the Law Department in making foreclosures, but the Finance Commission is of the opinion that this does not excuse him of responsibility in the matter since he can arrest the delinquent taxpayers.

Aside from the money due the city on tax deeds, there was outstanding water rates to the amount of $273,000 from 1924 to 1928, inclusive. Since 1924 the city has had a lien against the property of the debtor for all unpaid water bills. Claims for these bills have been regularly filed in the Registry of Deeds against the debtor property owners, but they have not been enforced. In this respect the Commission says the City Collector has not followed the law.

The Finance Commission, which is an agent of the state government, makes certain recommendations for temporarily clearing up this situation.

Reporting Finances in Rochester

CITY Comptroller C. E. Higgins of Rochester has recently issued his annual report for 1929, which he has attempted to popularize with a fair degree of success. He says he has tried to get away from "a collection of balance sheets and other accounting statements that mean little or nothing to anybody except a trained accountant or financial man." He presents the salient facts about the city's finances in the first dozen pages of the report. In many instances these facts are supported by graphs. In this way he hopes to reach the understanding of the "average taxpayer" and rescue the report from the oblivion of the waste basket or the dusty shelf.

A Correction Anent Cincinnati's Annual Report

IN the August issue we discussed briefly the annual reports of three manager cities, one of which was the Cincinnati report on "Municipal Activities" for 1929. We stated that C. A. Harrell, who was for some time executive assistant to Colonel Sherrill, was responsible for the preparation of this report, as he had been on two previous occasions. We wish to correct this statement inasmuch as we have since learned from Mr. Harrell, now City Manager at Portsmouth, Ohio, that the 1929 report was prepared by C. F. Sharpe, now executive assistant to C. A. Dykstra, who recently succeeded Colonel Sherrill as City Manager.

Relative to the circulation of the Cincinnati report for 1929, Mr. Sharpe writes that more than 1,000 copies have been distributed to various cities, libraries, schools, colleges, and citizen organizations. There has been quite a local demand for the report, coming from taxpayers, civic associations, business organizations, and public schools.

Baker Tractor "V" Plow in Action

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The many models of snow plows include both blade and "V" types for any standard motor truck or leading industrial tractor. The new one-way speed plows are made for both heavy and light trucks including Ford and Chevrolet. The famous Baker Patent Trip Blade Snow Plows with substantial improvements are offered as the last word in blade type snow plows for trucks. The "speed" "V" plows in two models are real snow fighters.

In Baker Tractor Snow Plows, you will find unusual features, both in "V" and blade types—sturdy construction and dependable performance which have made them so popular. If it is a Baker Plow it will make good for you.

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It will pay you to get the big Baker Snow Plow catalog—56 pages of interesting information on the latest in snow fighting equipment.

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Please send your Snow Plow Catalog.
Interested in snow plows for attachments to

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Give name of trucks or tractors

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Name

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Baker Trip Blade Truck Plow

THE MONTH IN PUBLIC HEALTH

Conducted by JAMES A. TOBEY, Dr. P.H.

Calvin Coolidge on Health

THE Presidents of the United States have, in general, attempted to follow the well-known precept expressed by Disraeli that "the health of the people is the first duty of the statesman." As recounted in the book, "The National Government and Public Health," allusions to national health have frequently occurred in the regular or special messages of various Presidents to Congress.

Although Calvin Coolidge did not mention public health in any of his numerous official messages when President, he has recently done so in one of his daily messages to the American people contributed through the press. In his syndicated article for August 11, 1930, which appears in the *New York Herald-Tribune* and many other newspapers throughout the United States, the distinguished ex-President now turned journalist emphasizes the importance of good health as a national asset. His concluding advice is:

"Because illness makes us a liability to ourselves, our family and our community, we all have a personal obligation to keep well. To neglect the health is one of the most wasteful things a person can do. It is a violation of a moral duty. While both state and national agencies are alert to preserve health, the real success of all their efforts lies in the vigilance of the individual. If we would all think and try to live healthful lives we would greatly increase the power of the nation."

The interest of President Hoover in public health is well known and has been alluded to in this column on a number of appropriate occasions. The White House Conference on Child Health and Protection, called by Mr. Hoover, is to meet in Washington, November 19 to 21, 1930.

A Public Health Political Party

A POLITICAL party which has as its chief objective the promotion of public health has been founded in France and apparently is in a flourishing condition. According to the Paris correspondent of the London *Lancet* for July 12, 1930, and of the *Journal* of the American Medical Association for July 26, 1930, this *Parti Social de la Santé Publique* had had three meetings up to the end of June, and because of the character of the physicians, hygienists, and men active in politics who are behind it, is being taken quite seriously. The moving spirit in this unique political party is said to be M. Justin Godart, a former Minister of Health of France.

Some of the planks in the platform of this public health party are:

"(1) The inculcation of the taste for hygiene just as the taste for sport has been inculcated in the French nation; (2) agitation for legislative reforms in the field of public health; (3) creation of a budget corresponding to the public health needs of the nation; (4) provision of a properly equipped public health organization throughout the length and breadth of France."

Infant Mortality in Cities During 1929

THE second-lowest infant mortality rate in the history of the cities of the United States occurred in 1929, according to a valuable report issued by the American Child Health Association, of New York. The 1929 rate for 720 cities of 10,000 or more population in the Birth Registration Area was 66.2 deaths of infants under one year of age per thousand live births. This rate was lower than in 1928, when it was 68.3, but slightly higher than the low record of 1927, which was 64.9.

The 1929 rate was the lowest ever attained in Chicago, Philadelphia, Detroit, Boston and Baltimore. Pittsburgh exhibits the most outstanding decline, however, the rate dropping from 120 in the period 1916-1920 to 77 in the period 1925-1929.

Portland, Ore., had the lowest rate among the cities over 250,000 population. Seattle was a close second with 46 and Minneapolis stood third with 49. Among the 10 largest cities in the country, St. Louis and New York tied for first place with a rate of 59. Close on their heels came the metropolis of the middle west, Chicago, with a rate of 60. Other figures were Cleveland 61, Philadelphia 62, Los Angeles 65, Detroit and Boston 69, Baltimore and Pittsburgh 73.

St. Paul, Minn., was in the lead with a rate of 46 among the cities of the 100,000 to 250,000 class. Union City, N. J., stood first in the 50,000-100,000 class with a rate of 25. In the 25,000-50,000 class another Jersey community, West New York, stood in the forefront tied with Revere, Mass., each having rates of 26.

Among the smallest cities with populations from 10,000 to 25,000, Northbridge, Mass., had the low rate of 15.

As a group the cities of the Pacific Coast continue their undisputed leadership as the banner home for babies. Oregon and Washington lead the procession, with the cities of Minnesota in third place. Vermont, Utah and California cities show the same average rates.

For ten years a distinct service to public health has been performed by the publication of these annual reports on infant mortality. They are now compiled by Miss Anna Jablonower under the direction of George T. Palmer, Dr. P. H., of the American Child Health Association, of which Mr. Hoover is President and Dr. Samuel J. Crumbine is General Executive.

The Airplane as a Cause of Death

TEN years ago there were 150 deaths due to airplane accidents in the United States. In 1928 there were more than three times as many, or 473, and the death rate from this cause was just double what it had been the previous year. These data suggest, according to an article in the *Statistical Bulletin* of the Metropolitan Life Insurance Co. for May, 1930, that the time may not be far off when the airplane will be a significant cause of mortality. The automobile is, of course, already one of the most serious, but the airplane, contributing a death rate of only 0.4 per 100,000, has not yet attained much numerical importance in this regard. For some reason, more deaths from airplane accidents occur in California than in any other state.

Wooden Indians in Indiana

IN a pungent article in the *Monthly Bulletin* of the Indiana State Board of Health for July, 1930, Dr. Thurman B. Rice consigns the part-time health officer plan, which is more or less prevalent in his state, to the limbo of the wooden Indian era. "Traditions die hard," he says, and opines that one of the worst of them is the principle of part-time health protection. This writer declares that Indiana needs full-time health officers and needs them badly. He suggests that if a single county cannot afford such an essential official, several counties should join to employ a competent person for this important job.

There are many wooden Indians in the public health work of other states. Indiana is certainly no more backward in this matter than are numerous of her sister commonwealths. A note of hope occurs in *Health Briefs* of Tennessee for July, 1930, however, for there we are informed that 52 per cent of the rural population of that progressive state is now served by full-time rural health service.

New Health Center in California

AT Alhambra, Calif., a new health and welfare center to serve a population of 130,000 was dedicated the middle of August. This handsome building is the latest in a chain of health centers intended for the benefit of the people of Los Angeles County, of which Dr. John L. Pomeroy is Health Officer. According to *Health News* of that county for July-August, 1930, the plan for these centers was originated by Dr. Pomeroy in 1924.

Each health-center building provides

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During October we hope you will remember to mention THE AMERICAN CITY.

an emergency hospital for local practicing physicians to take care of emergency cases arising from automobile, industrial, or home accidents; health educational services through the weekly or daily maternal and child hygiene conferences; diagnostic services for suspected cases of communicable diseases or orthopedic defects; treatment clinics for the indigent sick; laboratory service for bacteriological and serological tests for disease diagnosis; public health nursing service; and general sanitation supervision.

All diagnostic and educational services are free to all persons, regardless of financial or social status; treatment clinics are restricted to indigent sick to avoid conflict with the practice of the medical profession.

In the event of any major disaster such as flood, earthquake, fire, or plague epidemic, the health center building functions as a base for the focus of health forces and first aid or nursing supplies.

Clothing and Health

ABBREVIATED skirts and scantiness in other attire have increased woman's height, improved her health and given her more mentality in the last two decades, while man, because he still clings to heavy clothing, has made less progress, according to Dr. Thomas Darlington, who gave a radio talk on clothing and health on August 20, 1930. That man must make radical changes in his clothing if he hopes to keep pace with "the once weaker sex," also was pointed out by the former New York City Health Commissioner.

"Clothing affects the health in several ways," said Dr. Darlington, "First, and most important, by covering the skin clothing absorbs the excretions of the skin and is concerned in the regulation of body temperature. Human beings were intended to live in the air. The structure of the human body shows that not only is air required for breathing, but that air should envelop the entire body. All clothing interferes with the normal body processes of heat regulation."

"What is needed principally by man," continued the speaker, "is a substitute for the jacket, waistcoat, shirt, collar and scarf. One garment, the Russian blouse, will take the place of all of these and would enable the man to shed at one move at least three pounds of clothing. In the summer the blouse could be of linen or any light-weight material, with trousers of the same goods, while in winter it could be of velvet or some heavier material.

"The blouse would bring the upper portion of the body closer to the air and sunlight, permit the skin to perform its functions and permit greater play for the muscles. It would be a step forward on the road to better health and would, I candidly believe, give men, in a few years, equal opportunity with woman. And so long as he sticks to the antiquated jacket, waistcoat, shirt, collar and scarf he will continue to be what he is today, virtually at a standstill."

New York City Seeks Legal Quietus from Many of Its Needless Noises

MORE effective legal control over loud radios both in residence sections and in stores is aimed at in a series of amendments to existing legislation formulated by the Noise Abatement Commission of New York City, either already adopted or for which adoption is now sought.

The first of these now amends Section 215-a of the Sanitary Code, which has to do with loud, excessive or unusual noises in the operation of radios, etc.; and constitutes such disturbances a clear violation of the law, punishable like other violations of the Sanitary Code and the ordinances without necessity of a court action.

The second now amends the Code of Ordinances and puts a stop to the offensive noises produced by loud speakers in public streets and public places. It permits, for reasonable and legitimate purposes, public announcements by loud speakers in places where citizens would not be disturbed.

LESS NOISE!
in our neighborhood
Let's make it a pleasanter and quieter place to live and work . .
We have discontinued the playing of our radio outside our shop . . .
It's against the law now
If you want to hear our radios
COME IN!

RADIO SHOPS IN NEW YORK HAVE COOPERATED WITH THE NOISE COMMISSION BY DISPLAYING THIS POSTER

The third is an amendment to the Charter of Greater New York and is a far-reachng one, covering not only noises, but many minor offenses which constitute violations of the Sanitary Code, park ordinances, and other police regulations. It seeks to introduce in New York a system now in successful operation in European cities as well as in some of our own. It would obviate court proceedings in the vast majority of cases by establishing a schedule of fixed fines for violations. This charter amendment has the support of the Police Commissioner, and is now in the hands of the Drafting Commissioner. Its full text follows:

"Section 113. In the case of minor offenses constituting violations of the code of ordinances, including the Sanitary Code and park ordinances, not involving serious danger to health, morals, safety or public welfare, the head of any department, the administration of which is concerned with such violations, is hereby authorized and empowered to prepare and promulgate a schedule of such offenses with fixed fines applicable hereto not to exceed five dollars for each such offense to be paid by offenders who admit violation of the same and who do not desire a judicial hearing. Said department heads are further authorized and empowered to make rules regulating the giving of notice of such violations by the police or by any appropriate department representative. The notice of violation hereunder shall be returnable at the police station house in the precinct where the violation occurred, and the superior police official on duty therein shall receive said fine, give the offender a receipt therefor, and duly account for all fines so received to the chamberlain of the city of New York in such manner as the chamberlain may provide. Nothing in this section contained shall prevent the police or representative of any department from serving a summons in a proper case or making an arrest as provided by law."

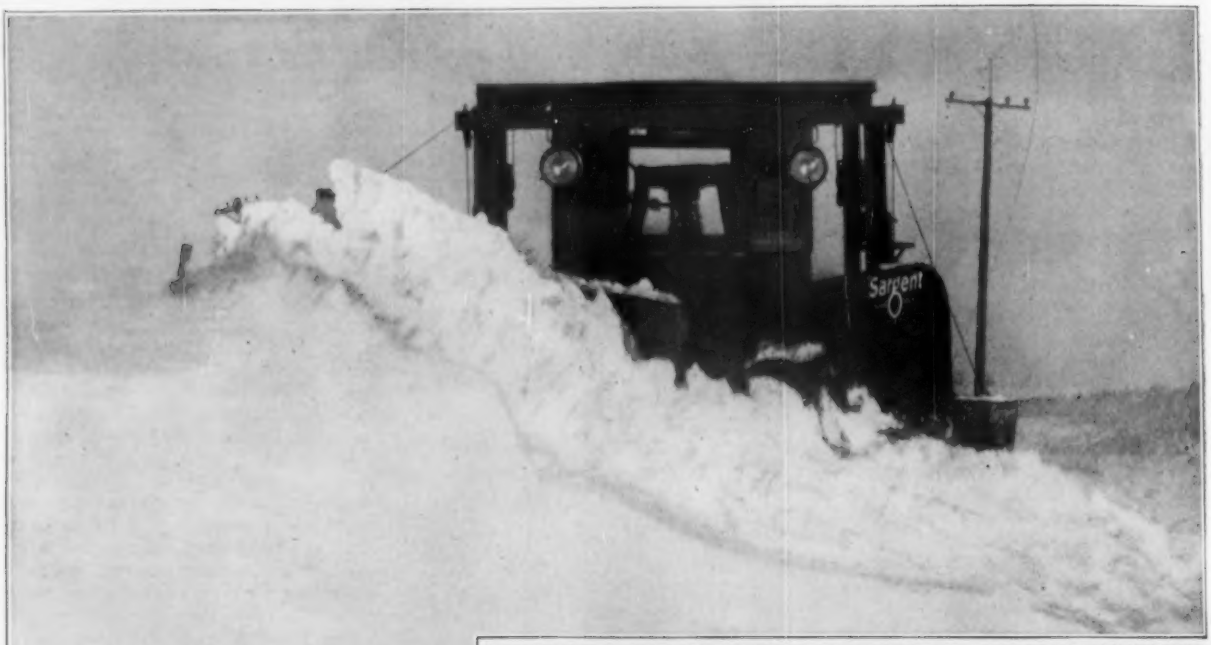
In addition to its many important studies into the causes of the city's worst noises, and into the effects of noise on the health and efficiency of city dwellers, the Noise Abatement Commission* is steadily carrying forward through its Remedies Committee a program of noise-control legislation, of which the three above cited amendments are recent examples. Another amendment to the Sanitary Code now pending would make unlawful the blowing of horns by drivers of automobiles not in motion, "except as a warning in the presence of imminent danger." Two others have to do with noises incident to building operations. These would prohibit (1) use of any internal combustion engine, air compressor or steam engine not equipped with a muffler or silencer; and (2) building operations between the hours of 5 P.M. and 8 A.M., if by their noise they shall disturb or annoy any person in the vicinity thereof.

* See THE AMERICAN CITY for December, 1929, page 154.

PARKING PROVISIONS IN 200 CITIES

MUNICIPAL parking areas are provided in 12 New York State cities and in 15 cities outside the state, according to replies from over 200 cities questioned by the New York State Bureau of Municipal Information in preparation for Report No. 1149 on Municipal and Private Parking Places. Except in 6 cities, no charge is made for parking on the municipal grounds. In 36 cities outside of New York State a license fee is charged for private parking garages, and in 28 cities a license fee is charged for vacant lots used for parking purposes. No New York State city reported charging a license fee for privately owned parking places. The report presents other data with regard to licenses, fees and rates, as well as the ordinances regulating the storage of automobiles in six different cities.

Speed for the light falls
Power for the heavy drifts



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Mention THE AMERICAN CITY—it helps.

Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Recent Zoning Ordinances and Statutes

Oceanside, Calif.	Ordinance	May 28, 1930
Oroville, Calif.	"	April 7, 1930
Pasadena, Calif.	"	April 1, 1930
Boise, Idaho	"	January 10, 1930
Elgin, Ill.	"	January 20, 1930
Winnetka, Ill.	"	June 3, 1930
Zion, Ill.	"	April 14, 1930
Topeka, Kans.	"	November 5, 1929
Wichita, Kans.	"	May 19, 1930
Fort Lee, N. J.	"	1930
Seaside Park, N. J.	"	August 18, 1930
Teaneck, N. J.	"	Sept. 10, 1929
Dobbs Ferry, N. Y.	"	June 30, 1930
Elmira, N. Y.	"	August 4, 1930
Huntington, N. Y.	"	July 31, 1930
Long Beach, N. Y.	"	July 8, 1930
Mamaroneck, N. Y.	"	February 18, 1930
Medina, N. Y.	"	February 1, 1929
Pittsford, N. Y.	"	February 18, 1930
Springfield, Ohio	"	August 4, 1930

Virginia, Laws, 1930, Chs. 205, 317.

Undertaking Establishments

ALABAMA.—*White v. Luguire Funeral Home*, 129 So. 84.—In fixing the boundaries of commercial and residential districts the trend of development should be considered. The zoning of the site of a funeral home within a district changing from residential to business is not arbitrary or unreasonable.

Outdoor Advertising

CALIFORNIA.—*People v. St. John*, 288 Pac. 53.—Reasonable ordinances regulating or prohibiting the distribution of handbills and other advertising matter are a valid exercise of the police power.

Vested Right

CALIFORNIA.—*Wheat v. Barrett, Building Inspector, U. S. Daily*, September 15, 1930. The Court, on appeal from a judgment granting a writ of mandate to compel the building inspector of a city to issue a building permit for the construction of a $100,000 store building on the ground that the ordinance on which the building inspector had based his refusal to issue the permit was void, can set aside the judgment and annul the writ on the ground that the construction of the building will violate a new valid ordinance adopted subsequent to the rendition of the judgment appealed from, although the petitioner had purchased the land and had spent $1,000 for excavation and for services of architect and surveyor, since such expenditures did not give petitioner a vested right in the permit.

Church in Residential District

KENTUCKY.—*Mechling v. Dawson*, 28 S. W. (2d) 18.—Although the erection of a church and parish house in a subdivision restricted by private covenant to use for dwelling purposes may be a violation of that covenant, it is too slight and inconsequential a violation to effect a material change in the character and use of the district; and the owner of a lot in the subdivision who did not object to these buildings is not thereby estopped to object to the erection of a business building therein.

Miniature Golf Course in Residential District

NEW YORK.—*Breba Realty Co. v. City of White Plains*, Supreme Court, reported in *White Plains Daily Press*, August 7, 1930.—"Miniature" or "Tom Thumb" golf; and a "miniature golf field" cannot be admitted into a residential district as a playground, a public recreation building or a golf course.

Dry-Cleaning Plant—Nuisance

MICHIGAN.—*Burdick v. Stebbins*, 231 N. W. 57.—A dry-cleaning plant is not a nuisance *per se*.

Platting

NEW YORK.—*Kraushaar v. Village of Lawrence*, Supreme Court, Nassau County, reported in *N. Y. Law Journal*, July 2, 1930.—The village is justified in refusing to approve a plat which did not conform to a village map or plan duly adopted by it.

Airports

OHIO.—*Swetland v. Curtiss Airports Corporation*.—The opinion in this case as first handed down and summarized in our August *Notes* has since been amended, apparently for clarification. If, as first written, it might be interpreted as intimating that any transit of the air space within 500 feet of the surface of land adjoining an airport is a trespass or a nuisance, it is now clear that, in the opinion of the Court, this is not necessarily so. The case holds that such a transit is an invasion of the rights of the plaintiff only where, as in this case "such crossing involves an unreasonable interference with property rights or with effective possession. . . . Whether property rights or effective possession is interfered with unreasonably, is a question of fact in the particular case. . . .

"It is, of course, conceivable and very probable that in other cases, depending upon the character and extent of the operations of the adjoining airport" [and, it is submitted, although the judge does not say so, depending also upon the nature and use of the adjoining land] "effective possession may not be interfered with by flights at lesser altitudes than 500 feet in taking-off and landing."

Implied Repeal of Zoning Ordinance—Buildings Under Construction

TEXAS.—*Scott v. Champion Buildings Co.*, 28 S. W. (2d) 178.—A comprehensive zoning ordinance, covering the entire subject-matter of earlier ordinances, impliedly repeals them.

The provision in a zoning ordinance excepting from its operation buildings under construction, is applicable only to buildings legally under construction before the effective date of the ordinance; and is inapplicable to one acting in defiance of a pre-existing ordinance.

Traffic Control

The Civic Department of the Chamber of Commerce of Kansas City, Missouri, announces the publication of a book entitled "A Traffic Control Plan for Kansas City," by Dr. Miller McClintock, Director of the Albert Russel Erskine Bureau of Harvard University.

Zoning in Akron, Ohio

The Annual Report of the Board of Zoning Appeals for 1929, in typewriting, has just appeared. It contains a full report of the important cases decided by the Board, and the usual statistics of the work.

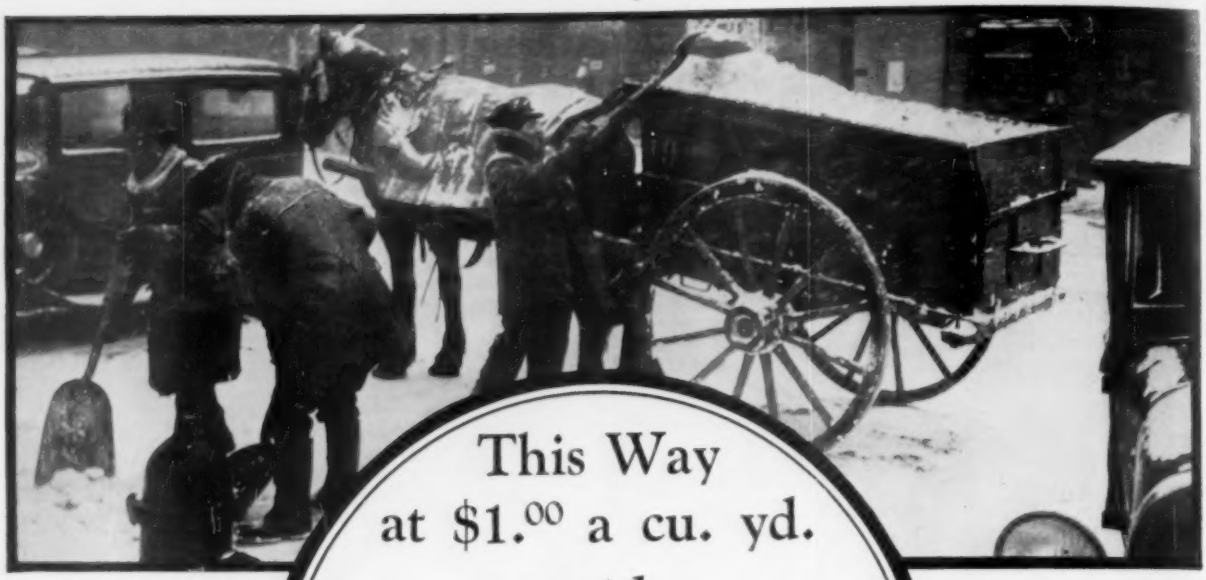
PRESIDENT HOOVER STRESSES CITY PLANNING AT FIRST MEETING OF CONFERENCE ON HOME BUILDING AND HOME OWNERSHIP

IN addition to pointing out that "the finance of home building, especially for second mortgages, is the most backward segment of our whole credit system," President Hoover, at the first meeting of the planning committee of his Conference on Home Building and Home Ownership, on September 24, stressed the importance of more than an ephemeral study of housing as a community problem.

"The helter-skelter building of homes adjacent to our cities," said the President, "produces many inadequacies and wastes. Such a question at once raises large problems of city and industrial planning, as well as problems of finance. The automobile has made such communities far more practical than ever before.

"I am in hopes you can find the time and organization to go even further afield than individual home ownership into this whole question of housing. This will at once carry you into the apartment and rural fields as well.

"Besides these questions, there are problems of architecture, esthetic questions and questions of interior convenience, as well as problems of construction—all of which have large importance and enter into rural as well as urban homes."



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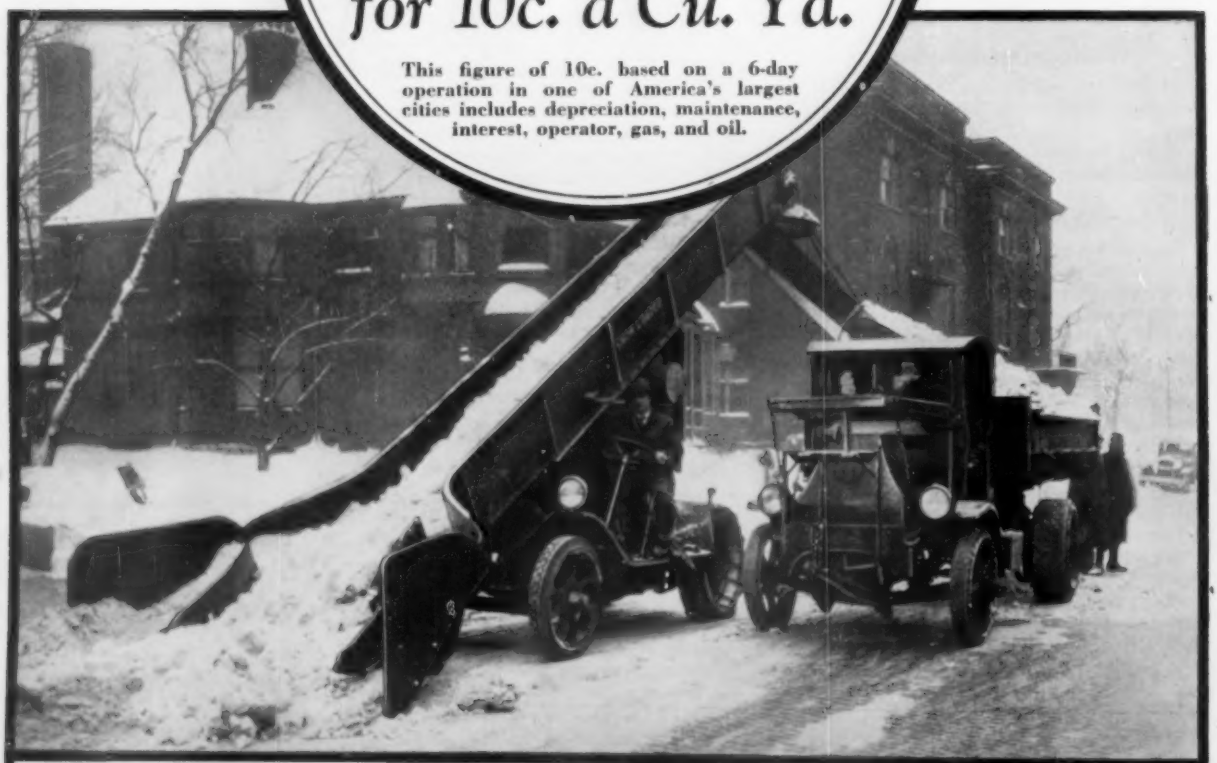

JOY Manufacturing Co., *Franklin, Pa.*

THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Council May Be Required to Call New Election When Date Is Unduly Delayed

A California statute provides for calling an election, on four weeks' notice, by a city council "without delay," on the question of consolidation with another city, on proper petition being filed. August 12, 1929, a City Council found that proper petition had been presented, and called a special election for April 14, 1930. But in the case of *Crowhurst v. City Council of City of Albany*, 280 Pac. 196, the California District Court of Appeal ordered that the call be canceled and a new one issued, fixing the election date not more than six weeks after service of the writ of mandamus.

The Court said that the statutory requirement for calling an election "without delay" was mandatory, and that it could not legally be disregarded by the City Council on purely political grounds.

City's Workmen's Compensation Liability for Injury to Fireman Lent to Another Municipality Depends Upon Retention of Control

A city may be liable under the Pennsylvania Workman's Compensation Act for injuries to its volunteer firemen for services rendered near its border or by a reciprocal arrangement with other municipalities for mutual protection, provided the firemen continue under the control and direction of their own superiors. Where the employees are lent to another municipality and are under the latter's control, no claim can arise against the regular employer. (*McGregor v. City of Monongahela*, 21 Pa. Munic. Law Rep. 129, decided by Washington County, Pa., Court of Common Pleas.)

Village Held Entitled to Remove Trees from Street to Prevent Sewer Obstruction

Village authorities removed six poplar trees that had been planted in a street by an abutting property owner 25 years before. The reason assigned for removal was to prevent obstruction of sewers by vagrant roots. The abutter was awarded $500 damages by a jury, but the Ohio Supreme Court set the verdict aside, saying (*Village of Willard v. McElligott*, 169 N. E. 447):

"It is admitted by plaintiff that, if the immediate use of the portion of the street occupied by this row of six trees were necessary to accomplish a contemplated improvement, such as the grading, paving, sewering, widening, lighting, or other public street use of like character, then it would have been entirely proper for the village to remove the trees; but the contention of plaintiff is that the village cannot justify its action in removing the trees by offering evidence strongly sustaining its position that these trees were a menace to the use of the street by the public and should have been removed. A presumption attends the action of the village that it was taken in good faith and for a proper purpose, and the burden was on the plaintiff to establish that the village acted without legal right.

"This Court cannot assent to the proposition that a municipality must defer all action with respect to things placed in the street by abutting lot owners until the city actually needs that space for the completing of some street improvement such as hereinbefore enumerated. The law of Ohio places all streets under the control of the municipality, and commands the municipality to keep the streets open, in repair, and free from nuisance."

Important Legal Decisions

involving municipalities, as reported in this department during 1929, are indexed and classified in the 1930 MUNICIPAL INDEX. This reference list, commencing on page 151 of the new INDEX, supplements lists appearing in the 1929 and 1928 volumes, and covering all decisions reported in this department since its inception in 1924.

Segregation of Races in Enjoyment of Park Facilities, etc., Upheld

Under a statute authorizing a board of park commissioners to regulate the use of parks, the Kentucky Court of Appeals lately decided that the board could validly assign to the colored people of Louisville certain parks, swimming pools, playgrounds, and equipment for their exclusive use in part, and to designate others for the exclusive use, in part, of white people. (*Warley v. Board of Park Commissioners*, 26 S. W. 2d, 554.)

Contract with Railroad Held Void as a Discriminatory Exemption in Assessments for Sewers

A Kentucky city and a railroad company agreed that the railroad would furnish a site for a sewage disposal plant and permit construction of a sewer across its land, in consideration of certain limitations in the assessment of the railroad property for the sewer improvement. Holding that the contract was void as being discriminatory against other taxpayers, the Kentucky Court of Appeals said:

"The other property owners in the fourth sewer district were not in a position to contract with the city, and did not make any contract for reimbursement; nor did the city provide for reimbursement in the ordinance making the assessment. On the contrary, they were required to pay the whole amount of their assessment. The result is that the railroad secured by the ordinance and contract made pursuant thereto a right or privilege denied to other property owners similarly situated. No question of public service is presented. No question of classification is involved. The ordinance was for the benefit of one taxpayer." (*City of Corbin v. Louisville & N. R. Co.*, 26 S. W. 2d, 539.)

Statute Held to Impose Gasoline Tax on Municipalities

The gasoline tax law enacted by the Mississippi Legislature in 1928 manifests an intention to impose the tax upon municipalities, according to the decision rendered by the Supreme Court of that state in the case of *City of Jackson v. State*, 126 So. 2. The Court said:

"It is undoubtedly the general rule that, where the effect of a statute is to restrict the rights of, or impose liabilities upon, the state or its political subdivisions, it will be held to be inapplicable to them, unless they are included expressly or by necessary implication. The language of this statute includes within the designation of distributors who are required to pay the tax all persons using on streets or highways gasoline purchased or acquired from any source other than a duly licensed distributor, and we are influenced to conclude that it was the intention of the Legislature that municipalities should pay the tax by an analysis of the provisions of the act expressly providing a method by which the Federal Government, and its departments and instrumentalities, are relieved of the payment of the tax."

Ordinance Forbidding Keeping of Hogs Within City Limits Held Void

The uncleanliness of swine is the fault of their keepers, rather than an inherent shortcoming, according to the decision handed down by the Kansas City Court of Appeals in the case of *Kays v. Versailles*, 22 S. W. 2d, 182.

The Court decided that an ordinance prohibiting the keeping of swine within the corporate limits of defendant city between April 1 and October 15 was void for unreasonableness, particularly as applied to a sparsely settled part of the city. In part the Court said:

"As the keeping of hogs is not a nuisance *per se*, the ordinance of the city of Versailles attempting to prohibit their keeping anywhere within the city is void. . . . A rule that hogs may not be kept in a city from April 1 to October 15 would in many cases amount to an absolute prohibition of hogs within the city limits at all, for such a requirement would force many who had no other place to keep their hogs to sell them before April 1 regardless of market conditions. In other words the right to have hogs in the city limits is so circumscribed by the ordinance as to make it a wholly

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unreasonable regulation if not a prohibition. . . .

"The keeping of hogs in a filthy pen near a dwelling in a city or town is a nuisance *per se* whether they are kept in winter or summer. . . . Hogs may be kept even in the summer time so as not to be obnoxious to the health of human beings. It is well known that a hog is one of the cleanest of animals, so far as his person is concerned, if given a chance to be clean."

Rules of Procedure Adopted by One Legislative Body Are Not Binding Upon Successors

The Georgia Supreme Court draws attention to the important, but often overlooked, legal principle that rules of procedure created by a city council are not binding upon its successors, excepting as expressly adopted. (*South Georgia Power Co. v Baumann*, 151 S. E. 513.) In this case it was unsuccessfully contended that a franchise ordinance was void because passed at a special meeting and not read twice as required by an ordinance previously adopted. The Court said:

"Rules of procedure passed by one legislative body are not binding upon subsequent legislative bodies operating within the same jurisdiction. No legislative body can divest its successor of its legislative powers by passing ordinances or resolutions which deprive their successor of the power to exercise fully their legislative discretion. Each legislative body, when it meets, and unless restrained by the authority which created it, is without rules of procedure, and has inherent power to make its own rules without reference to the action of preceding bodies. Where a city council resolves that the rules of the prior council be adopted until a committee reports rules, the prior rules cease to be in force on the report of the committee. . . . Although the rules of a prior council, temporarily adopted until new rules can be reported by a committee, provide that they cannot be amended except by a two-thirds vote, the new rules, when reported, can be adopted by a majority vote. . . . The only province of the courts is to inquire whether charter provisions have been followed. Charter provisions are structural, and the courts have a right to inquire whether they have been complied with. Parliamentary rules are merely procedural, and with their observance the courts have no concern. They may be waived or disregarded by the legislative body."

Garbage Disposal Contract Held Not Governed by Provisions Regulating Granting of "Franchises"

In the case of *Wallis v. Fidelity & Deposit Co. of Maryland*, 285 Pac. 656, the Washington Supreme Court held that the surety company was not entitled to release from liability on a bond securing performance of a contract with the city of Kelso for garbage removal, on the ground that the contract was a franchise and had not been granted under statutory requirements regulating the granting of franchises. The Court said, in part:

"That a city in this state has the right under the police power to handle garbage itself, or to provide for its being handled by private parties, is well settled. . . . If the right granted by this ordinance is a franchise, then the record clearly shows that it was invalid by reason of the fact that it was not passed in accordance with the provisions of the statute above quoted. But the fact that it is denominated a franchise in the ordinance and in the bond does not make it a franchise unless it is one in fact. That the exclusive right to collect garbage in a city is not a 'franchise,' as that term is used in the statute, is settled in this state by the cases above cited."

Control of Streets Cannot Be Privately Restricted in Dedicating Them; City May Compete with Privately Owned Public Utility

Defendant city in Texas had permitted a privately owned electric light plant to operate without a franchise. Later the city arranged to operate a plant of its own and ordained that public utilities should not thereafter operate without a franchise. But still later that ordinance was replaced by one merely forbidding extensions, etc., without a franchise. The company sued to enjoin enforcement of the ordinances.

In the case of *West Texas Utilities Co. v. City of Spur*, 38 Fed. 2d, 466, the United States Circuit Court of Appeals, Fifth Circuit, recognized the company's right to continue to operate its existing lines, but subject to regulation by the city.

The right to a franchise was claimed on the ground that appellant company succeeded to the rights reserved by the former owner of the land comprising the city, a town-site corporation which dedicated the land shown in the plat as streets and alleys by an instrument that reserved to the grantor or its assigns "the 'right to construct, erect and maintain telephone and electric light poles in and upon, across and over any and all streets, etc.'" The right to such a franchise was claimed on the additional ground that for many years the city acquiesced in the operation by the company and its predecessors of an electric light plant in the city and in the use of streets and alleys for the posts and transmission lines of such plant.

Disposing of the case, the Circuit Court of Appeals said:

"The claim of the appellant based upon the above-set-out provision, whereby the town-site corporation undertook to reserve to itself and its assigns the right to make specified uses of dedicated streets and alleys, is not sustainable. Such a restriction or reservation is void, because it is repugnant to the dedication and is violative of the public policy evidenced by statutes conferring on governing bodies of municipalities power to control such uses of streets and alleys as are referred to in the provision in question.

"We do not think that appellant [the company] as a taxpayer was entitled to relief on the ground that the city, in arranging for the acquisition and operation of its own electric light plant had the purpose to monopolize the business of furnishing electric light and power. . . . Unless forbidden by statute, an authorized acquisition and operation by a municipality of such a public utility as an electric light plant may be accompanied by a purpose to prevent competition by another owner of such a utility. . . . The city was authorized to own and operate an electric light system. . . . The exercise of that power is for public benefit, not for private benefit. We have not been referred to any statute which makes it unlawful for a municipality to acquire the exclusive right to own and operate such a public utility for the benefit of its inhabitants."

Benefited Agricultural Land Held Not Entitled to Detachment from Village, Where Symmetry of Village Would Be Impaired

A judgment denying the owners of agricultural land the right to have the same detached from a village in statutory proceedings was upheld by the Idaho Supreme Court in the case of *Ball v. Village of Parma*, 286 Pac. 24.

The opinion notes that, under the governing statute, right to detachment depended upon the land being more than five acres in area, being exclusively used for agriculture, receiving no benefits from the village government justifying its retention, and being subject to detachment without materially impairing the symmetry of the municipality.

The Court noted that benefits were derived from municipal water and drainage. But the principal ground on which the Supreme Court denied the plea for detachment was that it would impair the municipality's symmetry. The Court remarked:

"We think that the symmetry that is involved here is equally, if not more, concerned with the general outlook upon the surroundings within the village limits adjacent to residence and business districts than it is with the regularity of the exterior boundary lines."

Right of City to Establish Ice Plant as "Public Utility" Sustained in Texas

In opinion approved by the Texas Supreme Court (*City of Denton v. Denton Home Ice Co.*, 18 S. W. 2d, 606), the Commission of Appeals of the state lately decided that a statute authorizing home-rule cities to buy or construct gas plants, etc., and other "public utilities," permits the establishment of a municipal ice plant. The opinion says:

"We . . . have reached the conclusion that the best authorities support the contention of the city of Denton to the effect that ice is a public utility, so far as the right to manufacture and sell the same is concerned."

The Court cites similar decisions reached by the appellate courts of Oklahoma, Georgia, Arizona, Maine, Minnesota and Nebraska.

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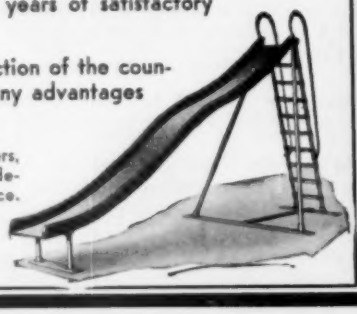

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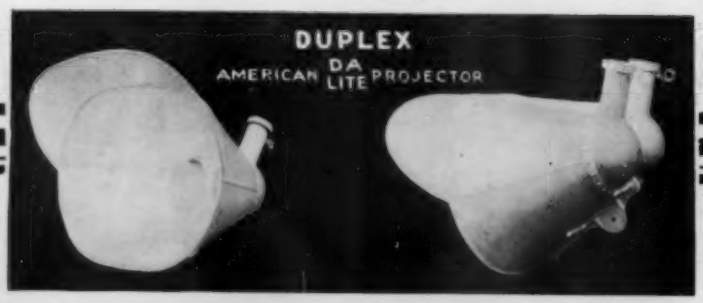

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MUNICIPAL AND CIVIC PUBLICATIONS

Prices quoted do not include postage, unless so stated.

The Measurement and Control of Municipal Sanitation

The Committee on Uniform Street Sanitation Records, of the International Association of Street Sanitation Officials, with the aid of a technical staff and an advisory committee representing various national organizations concerned with municipal affairs, is actively working towards comprehensive, practical and fundamentally correct results in its sector of the movement for establishing uniform and significant municipal standards. Its work has been facilitated by financial assistance from the Julius Rosenwald Fund and the University of Chicago. The report at hand is a tentative draft, under date of September, 1930, of a report dealing with (1) the need of measurement standards in municipal sanitation, with description of how standard measurements of sanitation operations and costs can be established and how they can aid the sanitation official in managing his department, (2) measurements applied to sanitation activities, including street cleaning, snow removal, refuse removal, refuse disposal and catch-basin cleaning, and (3) records and cost-accounting procedure. This report is intended to stimulate interest and discussion, prior to the completion of a final report, and will undoubtedly be of much value on its intrinsic merits.

Parking and Garage Problem of the Central Business District of Washington, D. C.

This report was prepared under the sponsorship of the Automobile Parking Committee of Washington by Miller McClintock, consultant, of the Albert Russel Erskine Bureau of Harvard University, and the staff of the National Capital Park and Planning Commission. On the basis of the factual material collected, conclusions and recommendations are presented. 81 pp., including many charts, maps and photographs. (Apply to the Automobile Parking Committee, Washington, D. C.)

Municipal Licenses for Hawkers and Peddlers and Transient Merchants

This bulletin of the Michigan Municipal League is a compilation by W. Rolland Maddox of information about the law and the practice concerning ordinances regulating hawkers, peddlers and transient merchants in Michigan. Some regulation of hawking and peddling has come to be almost essential for every city and village, and the license is the most effective device for control. Because there is considerable variation in license ordinances in Michigan, this compilation has been made for the benefit of municipal officials and others interested in the subject. 37 mimeographed pp., plus tabulation of licenses and procedure. $1.00. (Apply to the League, Ann Arbor, Mich.)

A Traffic Control Plan for Kansas City

The survey which led to the preparation of this report, which was made for the City-Wide Traffic Committee of Kansas City, Mo., by the Albert Russel Erskine Bureau for Street Traffic Research of Harvard University, was sponsored, and the report was published by, the Chamber of Commerce of Kansas City. (See page 140 of THE AMERICAN CITY for details of the plan.) The report is divided into three parts: I, Summary of Recommendations, containing general proposals and a consolidated traffic code; II, Character of the Problem, including a discussion of the elements involved, present street traffic conditions, street traffic and business, and street traffic and public safety; III, A Traffic Control Plan Recommended, with provisions for parking, pedestrian protection, special regulations, traffic signals, signs and markings, traffic planning and administration, the police and the courts. Appendices include statistical material. 272 pp., including a number of diagrams and tables. $5.00. (Apply to the Chamber of Commerce, Kansas City, Mo.)

Proceedings, American Municipal Association, 1929

Edited by John G. Stutz, Executive Secretary. Lawrence, Kans. 1930. 118 pages. $6.

The American Municipal Association now includes in its membership virtually all of the state leagues of municipalities in the United States and several from Canada. It is primarily an organization of the secretaries of these groups. Among the papers of general interest presented in this volume, those on "Functions of the Union of Canadian Municipalities," "Promoting Good City Legislation," and "Municipal Reporting," are of special value.

The City Manager Plan of Municipal Government

"A summary of opinions of Chambers of Commerce and others, in a limited number of cities in which the city manager plan is operating, on the success or failure of this form of municipal government in these communities" is published by the Chamber of Commerce of the United States to meet the increasing number of requests for such information. A list of pamphlet material on the plan, a directory of city manager cities and their managers, and a list of cities which have abandoned the plan, are appended. 39 pp. mimeographed. (Apply to the Civic Development Dept., Chamber of Commerce of the United States, Washington, D. C.)

Massachusetts—Its Industrial, Agricultural, Recreational and Economic Resources

The first folder ever published officially by the Commonwealth for the purpose of distributing general information about Massachusetts throughout the country contains on one side a large map of the state, and on the other concentrated facts about its resources as well as photographs of a number of typical scenes. It has been prepared by the Massachusetts Industrial Commission. (Apply to the Commission, State House, Boston, Mass.)

Fourth Annual Report of the London and Home Counties Traffic Advisory Committee for the Year 1928-1929: Street Accidents in Greater London

The report of the proceedings of the London and Home Counties Traffic Advisory Committee is presented to Parliament in pursuance of a section of the London Traffic Act of 1924 and relates the action which has been taken as a result of the provisions of the Act, besides giving advice on questions specifically referred to the Committee. The Street Accidents report is a summary of proceedings at the Conference on Street Accidents convened by the Minister of Transport and held in January, 1930, in London. 44 pp. and 21 pp.; 70c and 15c. (Apply to The British Library, 551 Fifth Ave., New York.)

Reflection from Road Surfaces

Technical Paper No. 9, Illumination Research, of the British Department of Scientific and Industrial Research, by A. K. Taylor. See page 159. London, 1930. 18 pp. 15c. (Apply to The British Library, 551 Fifth Ave., New York.)

Soliciting Schemes—Good—Bad—Indifferent

The Solicitations Committee of the Flint, Mich., Chamber of Commerce has prepared for its members a statement of its policy and "an explanation of the methods employed to help worthy and eliminate unnecessary, ill-advised, or fraudulent solicitations." Benefit events, the Church Bazaar, souvenir programs and yearbooks, block subscriptions, ex-service men's welfare organizations, and fraudulent soliciting schemes, are discussed. 18 pp. (Apply to the Chamber, Flint, Mich.)

Report of the Forward Atlanta Commission, 1926-1929

A handsomely printed and illustrated report describes the tangible accomplishments resulting from the expenditure of a fund of $722,328.50 which citizens of Atlanta, Ga., contributed to the Forward Atlanta Commission during the years 1926-1929, to advertise their city. (See p. 139 of this issue of THE AMERICAN CITY.) 110 quarto pp. (Apply to the Commission, Chamber of Commerce Bldg., Atlanta, Ga.)

A Model Election Administration System

Published as a supplement to the *National Municipal Review* for September, this report of the Committee on Election Administration of the National Municipal League was prepared by Dr. Joseph P. Harris of the University of Washington, Secretary of the Committee, to provide a concrete basis for new legislation designed to improve American election systems, which are as a rule "cumbersome, expensive, and ineffective in preventing fraudulent voting." 45 pp. (Apply to the League, 261 Broadway, New York.)

Salaries of Village Officials in Wisconsin, 1930

The demand for these salary reports in past years has convinced the Municipal Information Bureau, a University Extension Division of the University of Wisconsin, of their value. The 1930 figures for village officials represent all but 5 of the 358 villages in the state, divided into three population groups. 16 pp. mimeographed 25c. (Apply to the Bureau, University Extension Division, Madison, Wis.)

Miniature Golf and Its Regulation in New Jersey Municipalities

Special Report 265 of the Bureau of Municipal Information of New Jersey contains a general discussion of miniature golf and its rapid growth throughout the country, and information as to how some 46 municipalities in New Jersey are endeavoring to regulate the sport. 7 pp. mimeographed. (Apply to the Bureau, 34 W. State St., Trenton, N. J.)

A Housing Code

Recommended for Use by Municipalities of the State of New York. This suggested ordinance has been prepared under the direction of a committee, of which Darwin R. James was Chairman, representing the New York State Conference of Mayors and Other Municipal Officials, the New York State Department of Health and the State Board of Housing. It contains articles on administration, definitions, light and ventilation, means of egress, fire protection, and sanitation and lighting. An application form, estimated building costs and a list of fire-resistive constructions are offered in appendices. 93 pp. (Apply to George Gove, Secretary, State Board of Housing, 949 Broadway, New York.)

Housing in Philadelphia

The annual report of the Philadelphia Housing Association has been prepared by Bernard J. Newman. The problem of the blighted areas, minor street and alley housing, new dwelling construction, demolition of dwellings, house rents, legislation, insanitation and public education are discussed. 48 pp. (Apply to the Association, 311 S. Juniper St., Philadelphia, Pa.)

For Chicago I Will

The Story of the Chicago Community Trust for 1929. The Secretary's annual report describes the way in which the $93,004.16 income from Chicago Community Trust funds was distributed among 67 educational and charitable institutions in 1929, and analyzes the financial statements for 189 Chicago institutions that submit their figures to the Community Trust. 23 pp. (Apply to the Secretary, 10 South La Salle St., Chicago.)

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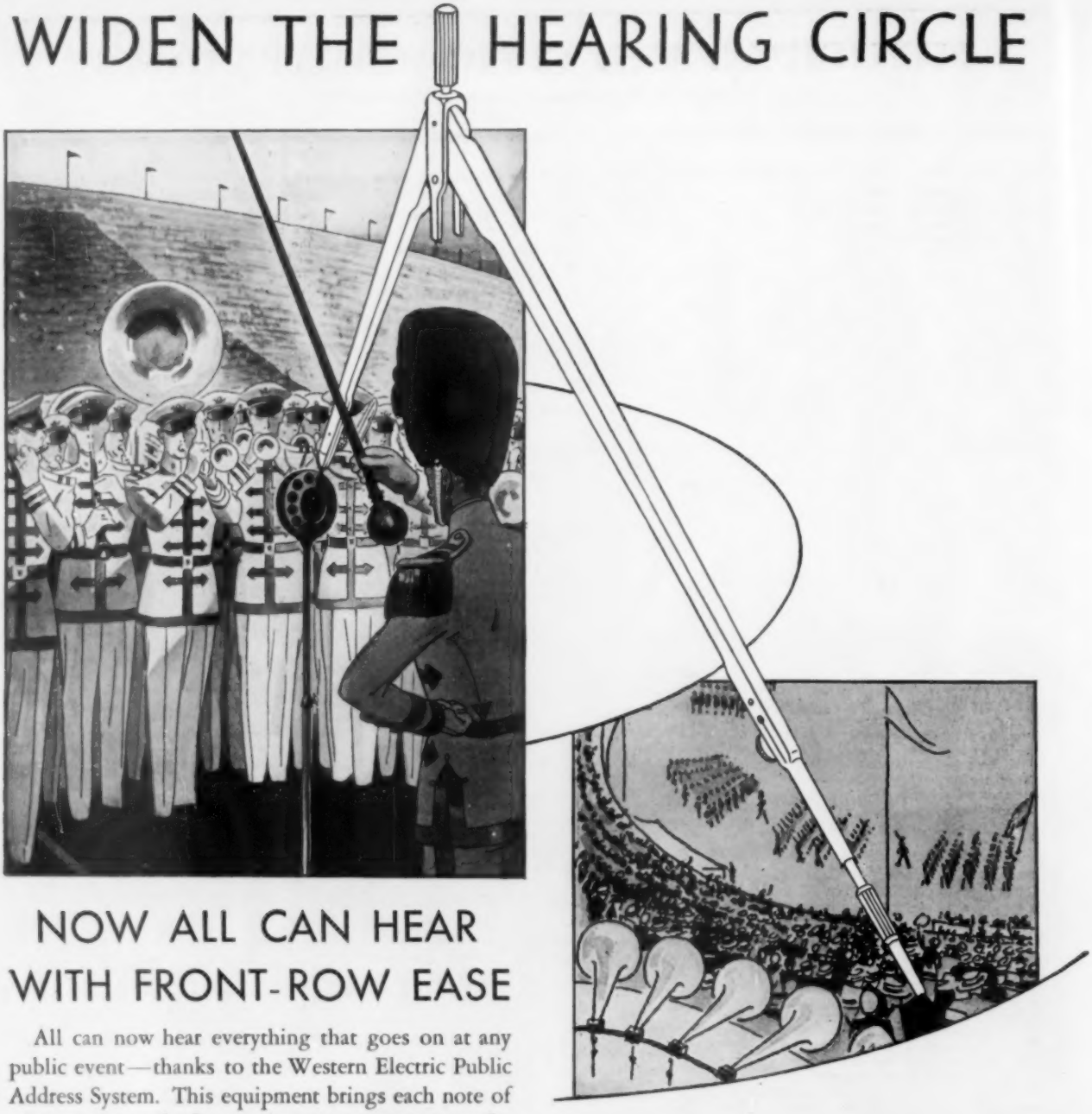

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The Civil Service in the Modern State

By Leonard D. White. University of Chicago Press, Chicago. 563 pp. $6.00.

This volume was sponsored by the International Congress of Administrative Sciences. The third of these conferences was held in Paris in 1927. From it sprang the *Revue Internationale des Sciences Administratives*, a journal devoted to administration, and the present collection prepared by a dozen authors under the leadership and editorship of Professor Leonard D. White. The volume has as many sections prepared by these international authorities and devoted to personnel administration of their respective national governments. Each has written a brief, regrettably brief, summary of the outstanding characteristics of the system and presents a series of documents establishing it. The section on our own civil service, written by Dr. White himself, is accompanied by the Pendleton Act, the Classification Act of 1926, the Rules of the Commission and similar statutes. The section on Great Britain, also by Dr. White, includes, among other documents, selections from the famous Macaulay Report. Several of the smaller countries of Europe are omitted and none of Latin America are represented.

Despite the fact that it does not treat of municipal civil service systems, there is much in this compendium's little volume which should be suggestive in the municipal field.

Uniform Building Code, 1930 Edition

The Pacific Coast Building Officials Conference in 1927 adopted a carefully prepared uniform building code, based on nationally recognized standards of construction and safety. This met with a considerable degree of use in cities on the Pacific Coast and elsewhere. The current revision, published in May, 1930, is a booklet of 271 pages. The original or the revised code has been adopted, up to September, 1930, by 81 municipalities, 72 of them on the Coast. $1.00. A pamphlet on the history and purposes of the code is available free. (Apply to the Conference, 19 Pine Avenue, Long Beach, Calif.)

Reduce Smoke and Save Fuel

The Akron, Ohio, Chamber of Commerce has prepared, on heavy paper 8 x 10 inches, suggestions which have proved successful in enabling residents to cut down their coal bills, at the same time reducing the city's smoke pall, of which 50 per cent comes from private homes. The cards are distributed through the schools in connection with talks on smoke elimination and air pollution. (Apply to R. C. Demary, Chief Inspector of Mechanical Equipment, 405 City Hall, Akron, Ohio.)

Munsey Park, Manhasset, Long Island

An attractive booklet describes this new suburban development which has been created on the North Shore of Long Island, N. Y., from the property, once the Louis Sherry estate, which was bequeathed to the Metropolitan Museum of Art in New York by the late Frank A. Munsey. A complete community plan, adapted to the topography of the land, has been followed; it was prepared by Henry Wright, city planner. The architecture is predominately Early American or Colonial, although on some sites houses of English or Norman derivation are permitted. 6 pp. (Apply to Garden Estates, Inc., 18 E. 48th St., New York.)

Meeting the Housing Needs of the Modern Family

An editorial in the *Boston Herald* for June 26 reviews the address on this subject made by John Nolen, city and regional planner, of Cambridge, Mass., in which Dr. Nolen makes a plea for zoning, city planning and building economies to make possible more single-family houses, supplied with modern labor-saving devices, open fireplaces, gardens and plenty of air and sunlight. (Apply to Dr. Nolen, Harvard Square, Cambridge, Mass.)

Investing the $1,500,000 Park Bond Fund

The Board of Park Commissioners, Louisville, Ky., reports in an attractively made and illustrated brochure of 42 pages upon the investments made from the special park improvement bond funds. Playgrounds, recreation buildings, parkways, bridges and an airport administration building are included. (Apply to the Board.)

Uniform Crime Reports

The responsibility for the compilation and publication of these monthly bulletins, which were issued from January to July, 1930, by the International Association of Chiefs of Police through its Committee on Uniform Crime Records, was taken over on the first of September by the National Division of Identification and Information, Bureau of Investigation, United States Department of Justice. For the present, it is stated, the *Reports* will include only the monthly returns of "offenses known to the police," which are voluntarily submitted by the municipal police departments, but at a later date annual compilations of persons charged with crime will also be collected, together with complete data from rural districts. The July bulletin includes a tabulation of police department employees in nearly 500 cities of 10,000 population and over according to the 1930 census (see p. 23 of this issue of THE AMERICAN CITY.) (Apply to the Director, Bureau of Investigation, Washington, D. C.)

The Individual Criminal and His Cure

The National Committee on Prisons and Prison Labor has published a pamphlet containing the address on this subject made by Dr. Alfred Adler, Viennese psychologist, at the 1930 annual meeting of the Committee. This is followed by a discussion of Dr. Adler's proposal that clinics be established in connection with penal and correctional institutions, by Dr. William J. Ellis, Commissioner, Department of Institutions and Agencies in New Jersey, Dr. Frederick J. Farnell, Chairman, Public Welfare Commission in Rhode Island, and Dr. Walter N. Thayer, Superintendent of Prisons in Maryland. 16 pp. (Apply to the Committee, 250 W. 57th St., New York.)

Public Power for Wisconsin

The brief submitted by the League of Wisconsin Municipalities to the Interim Committee on Electric Power of the Wisconsin Legislature, November 9, 1928, is now published in booklet form. It was prepared under the direction of the League's Committee on Public Power; a large part of the work having been done by Carl D. Thompson, Secretary of the Public Ownership League of America. It presents a discussion of municipal ownership, public power districts, and a state public power system. Financial statistics of Wisconsin municipal and private plants, and various rate comparisons, are included. 104 pp. 50c. (Apply to League of Wisconsin Municipalities, 114 N. Carroll Street, Madison, Wis. Free to paid-up members of Public Ownership League, 127 N. Dearborn Street, Chicago, Ill.)

Board Members' Manual

For Board and Committee Members of Public Health Nursing Services. Prepared by the National Organization for Public Health Nursing, Inc. The Macmillan Co. 1930. 127 pp. $1.25 from THE AMERICAN CITY.

This little book will be invaluable to anyone concerned with the organization and administration of a community nursing service. It tells how to organize, the duties and functions of officers and committees, and how to regulate the services, and their proper relationship with the medical profession and other organized groups.

JAMES A. TOBEY.

The Salary Rate of $5,000 and Above for Public Officials

Supplementing a discussion by Dr. Morris B. Lambie, Professor of Political Science at the University of Minnesota, in *Public Personnel Studies* for July (reprinted from the March, 1929, issue of Minnesota Municipalities), is a list of of the positions, designated only as "administrative," "executive," "professional," "scientific," or "staff," for which $5,000 or more was paid in 1928 in the Federal Government, in 36 state governments, in 16 large city governments, and in 12 counties. Salaries for judges or members of the teaching profession are not included. *Public Personnel Studies* is 50c a number. (Apply to the Bureau of Public Personnel Administration, 923 East 60th St., Chicago, Ill.)

New Publications, Aeronautics Branch, U. S. Department of Commerce

Aeronautics Bulletins have been issued in 1929 and 1930 on the following subjects: Air Marking (No. 4), Airports and Landing Fields (No. 5), Aeronautics Publications (No. 6), Air Commerce Regulations (No. 7), Airworthiness Requirements of Air Commerce Regulations (No. 7-A), School Supplement, Air Commerce Regulations (No. 7-B), Parachute Supplement, Air Commerce Regulations (No. 7-D), Regulations Governing Establishment and Certification of Aeronautical Lights and Instructions for Marking Obstructions to Air Navigation (No. 9), List of Air Navigation Charts (No. 10), Aircraft Engine Testing (No. 12), Relative Lift Distribution in Any Biplane (No. 14), Airport Rating Regulations (No. 15), Airport Management (No. 17), State Aeronautical Legislation and Compilation of State Laws (No. 18), Suggested City or County Aeronautics Ordinance and Uniform Field Rules for Airports (No. 20), Gliders and Gliding (No. 22), Medical Examiners of the Aeronautics Branch (No. 23). The First Report of the Liaison Committee on Aeronautic Research was issued in June, 1930. Notes on Airport Lighting, by Harry H. Blee (April 15, 1929) is also available, in mimeographed form. (Apply to Aeronautic Information Division, Department of Commerce, Washington, D. C.)

Business Districts in Subdivision Planning

Zoning Gains Through the Courts

These two articles by Carol Aronovici, city planner, have been reprinted, the former from the *National Municipal Review* for July, 1930, and the latter from *The Western City* for August, 1930. In the first the author explains why he believes that "no scientific standards of business zoning can be evolved without at the same time giving consideration to the type of business to be developed, the type and height of building contemplated or to be permitted, and the intensity of the land use that might be possible under the plan." In the second article Dr. Aronovici cites cases to support his contention that "the courts have dealt with the reality of zoning in the light of broad human principles," although "the zoning authorities have in most instances failed to keep pace with the demands of the times while trying to keep in step with the irate property-owning voter." 7 pp. and 4 pp. (Apply to Dr. Aronovici, 130 South Broadway, Los Angeles, Calif.)

San Francisco Neighborhood Organization

A series of short articles in the *Members' Bulletin* for July, of the National Community Center Association, considers phases of neighborhood organization in San Francisco under the following headings: Public School Centers Dropped During the War; Community Center Activities on Playgrounds; Improvement Clubs and Associations; Origin and Change in Civic Groups; the Civic League of Improvement Clubs and Associations; Fire Menace Arouses Homes; a Sample Civic Association; A Brief Survey of Community Organization in San Francisco (including a tabular presentation of material.) 10 pp. (Apply to LeRoy E. Bowman, Secretary and Editor of the Association, 403 Fayerweather Hall, Columbia University, New York.)

A Comprehensive City Plan for Knoxville

This 232-page illustrated report has been prepared for the City Planning Commission of Knoxville, Tenn., by Harland Bartholomew and Associates, city plan and landscape engineers of St. Louis, Mo. Sections are devoted to Major Streets, Transit, Transportation, Zoning, Recreation, Civic Art and Traffic Study. Appendices include land subdivision rules, the zoning ordinance and zoning enabling act, the ordinance creating the Park Board, and the city planning enabling act. $1.50. (Apply to Harland Bartholomew and Associates, 317 North 11th St., St. Louis, Mo.)

Airport Problems of American Cities

The September number of *The Annals* of the American Academy of Political and Social Science contains an illustrated 63-page supplement by Austin F. Macdonald, Ph.D., Professor of Political Science at the University of California, and Simon N. Patten, Fellow of the Academy. Separate chapters are devoted to discussions of Airports and the Department of Commerce, Airports of Today, Airport Ownership, Airport Finances, and Airports of Tomorrow. A list of selected references to official publications, books, pamphlets, and periodicals is appended. Single copies of *The Annals* are sold at $2.00. (Apply to the Academy, 3622 Locust St., Philadelphia, Pa.)

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HAZARD

Appraisers and Assessors Manual

By W. L. Prouty, Clem W. Collins and F. H. Prouty. McGraw-Hill Book Co. 1930. 500 pp. $5 from THE AMERICAN CITY.

This singularly compendious volume makes available for the serious-minded assessor a wealth of data on building costs, depreciation, obsolescence and appraisal practice. Some of this material is presented without much digestion, but the authors have done an especially thorough job. No pains have been spared in tabular material, charts, forms and pictorial illustrations. There is a useful glossary of architectural nomenclature and another of terms used in land valuation. Another valuable section reproduces assessment forms used in various cities. Not only is the material carefully and intelligently arranged and well indexed, but some of the comments on current theory and practice are thoughtful and discerning.

History of the Campus Plan of the University of Illinois.

By Leon Deming Tilton, B.S., A.S.L.A., and Thomas Edward O'Donnell, M. S., M. Arch., A.I.A. University of Illinois Press. 1930. 245 pp. $5 from THE AMERICAN CITY.

Today the University of Illinois has, in the words of its President, David McKinley, "a workable campus plan, a correlated landscape plan, and a new architectural tradition." The history of the development of the campus as here told in chronological sequence (1867-1929), is to a large extent the story of an evolving body of sound practice in the physical planning of a university. This fact is attributable to the splendid personnel of the staff through a generation, and the activity of this staff as a coordinating and unifying force bringing constantly to bear upon the developing problem the ideas of some of the greatest planners of the period. Clarence H. Blackall; former Illinois State Architect W. Carbys Zimmerman; Daniel H. Burnham; Frederick Law Olmsted; Holabird and Roche; and Charles A. Platt—these are but a few of the men whose ideas and work have combined to bring the Campus Plan to the present stage of its growth.

Appendices include a list of principal buildings, their cost, and the architect of each; also letters pertinent to the plan.

A Chapter of Child Health: Report of the Commonwealth Fund Child Health Demonstration in Clarke County and Athens, Ga., 1924-1928

The Commonwealth Fund, Division of Publications, New York. 1930. 169 pp. $1.00.

The five years' demonstration on child health subsidized from 1924 to 1928 by the Commonwealth Fund in Clarke County, Ga., which includes the city of Athens, is described and discussed in detail in this book. The type of community served, the degree of cooperation from county and health governing boards, from the medical profession, and from the community as a whole, and the different kinds of child health work put into operation, are discussed. There is also one chapter by Dr. W. F. Walker, of the American Public Health Association, who rates the work done according to the Appraisal Form of his organization.

This attractively printed bound book should be of interest and value to all city officials and public health and social workers, especially those in southern communities who may be interested in child health activities and administration.

JAMES A. TOBEY.

Fiscal Problems of Rural Decline

Special Report No. 2 of the New York State Tax Commission is "a study of the methods of financing the costs of government in the economically decadent rural areas of New York State," made by Ralph Theodore Compton, New York State Fellow in Taxation at Yale University and Research Investigator of the Commission. . The aim of the report "has been . . . to draw attention to such modifications of present laws as can be recommended on the basis of known facts and expressed public policies, and to point out such results as might be expected to follow from further field studies and statistical investigation." The problems in New York are identical with those in many other states and are capable of the same solution—the inauguration of a well-planned state economic policy. 283 pp. (Apply to the New York State Department of Taxation and Finance, Albany, N. Y.)

City Problems: 1930

The Proceedings of the twenty-first annual meeting of the Conference of Mayors and Other Municipal Officials of the State of New York, which was held in Utica June 9, 10 and 11, reprints sixteen addresses and papers on subjects of interest to municipal officials, and publishes a symposium giving the answers from 55 cities to questions as to the important problems their municipal administrations had solved during the last year and were endeavoring to solve. 160 pp. $1.25. (Apply to the Conference, City Hall, Albany, N. Y.)

Minnesota Year Book, 1930

The first Minnesota Year Book, prepared by the League of Minnesota Municipalities, contains 325 pages of factual material relating to local and state government, including a number of maps, charts and tables, and a calendar of Minnesota government (June 1, 1930, to July 1, 1931.) A large amount of material on taxation and finance in the various municipalities is included, and also much material on public-utility rates. The book is an outstanding achievement. $5.00. (Apply to the League, Room 16, University Library, Minneapolis, Minn.)

The Journal of Land and Public Utility Economics

The August number of this quarterly contains several articles of special interest to readers of THE AMERICAN CITY. These include among others: The Trend of Multi-Family Housing in Cities in the United States, by Coleman Woodbury; Legal versus Economic Principles in Utility Valuation, by D. F. Pegrum; Municipal Ownership and the Changing Technology of the Electric Industry: Trends in Use of Prime Movers, by Paul Jerome Raver; Population and Peak Land Values in Business Districts, by H. Morton Bodfish; The Fare Problem of the Atlanta Street Railways, by James M. Wright; Joint Operation of Municipal Utilities in Wisconsin, by E. Orth Malott. (*The Journal of Land and Public Utility Economics* is published by the Institute for Research in Land Economics and Public Utilities, 337 E. Chicago Ave., Chicago, Ill. Subscription price, $1.25 per copy; $5.00 per annum.)

Common Trees of New York

By Joseph S. Illick. This illustrated "handy pocket manual of the common and introduced trees of New York" has been prepared to meet a need for interesting and helpful information about the common trees. It has been presented to the schools of New York by the Charles Lathrop Pack Forestry Trust. 123 pp. (Apply to the American Tree Association, 1214 Sixteenth St., N. W., Washington, D. C.)

Kansas City Firemen's Pension Fund

At the request of the Police and Fire Committee of the Chamber of Commerce of Kansas City, Mo., the Kansas City Public Service Institute investigated the present firemen's pension system and has recommended in this report "a new system to take the place of the present one, which is in such an unsound financial condition and which is based on such an unsound financial theory that the only thing that can safely be done is to abandon it." 65 pp. (Apply to the Institute, 501 Orear-Leslie Bldg., Kansas City, Mo.)

Annual Report of the Bureau of Health, Trenton, N. J., 1929

An innovation on the part of the Bureau of Health is a well-multigraphed report which is not just a mass of statistical data to be filed away, but one which has been devised to present "in as brief, concise and readable form as possible . . . such information as might be desirable for all those interested in public health work." 68 pp., plus charts and graphs. (Apply to the Bureau, Trenton, N. J.)

A Bibliography of Publications on Casualty Insurance and Suretyship

This bibliography, prepared by Mildred B. Pressman, is classified according to subjects under three main heads—I, General, II, Special Lines, and II, Fidelity and Surety Bonds. A supplement contains a list of periodicals, society publications and publishers which appear in the bibliography. 23 pp. (Apply to the Library, National Bureau of Casualty and Surety Underwriters, 1 Park Ave., New York.)

Riders of the Plagues

By James A. Tobey, Dr. P. H. Charles Scribner's Sons, New York. 1930. 348 pp. $3.50.

There is no more glorious story than that of the conquest of disease. In this attractively printed and well-illustrated book, the great events and the dramatic episodes in man's unrelenting warfare on plague and pestilence have been set forth in an entertaining, instructive, and vivid manner. The subject matter is essentially biographical, for the story of health is woven about the careers and personalities of the notable men and women, Pasteur, Lister, Florence Nightingale, Gorgas, Walter Reed, Sedgwick, Trudeau, Noguchi, and many others, who have been responsible for the development of modern public health. Adventure and romance and glamor are all in this story, which should prove popular with the general reader as well as with the technician.

Before and After Prohibition

By Millard E. Tydings. The Macmillan Co. 1930. 131 pp. $2 from THE AMERICAN CITY.

This little volume proceeds from the proposition that "nothing is more needed in our national life today than a crystallizing of opinion regarding the merits and demerits of this policy of national prohibition." The author, a well-known "wet" Senator, endeavors to present "the best data obtainable." A better demonstration of the inconclusiveness of statistics in this field would be hard to find.

Regional Market Needs in New York State

This report of a committee appointed at the request of Governor Roosevelt by the New York State Conference of Mayors to study food distribution problems in New York State discusses the need for reorganization of our outgrown market systems, and recommends the establishment of regional markets, the benefits of which lie "in their ability to expedite the movement of farm produce between producer and consumer and cheapen the handling and market costs for the producer, the wholesaler, the jobber and the retailer over a wide area." (See THE AMERICAN CITY for March, 1930, p. 117, for a more detailed treatment of this subject.) 21 pp. (Apply to the New York State Department of Agriculture and Markets, Albany, N. Y.)

Women and Athletics

This compilation, edited by the Women's Division of the National Amateur Athletic Federation, "is an effort to put in convenient and permanent form the sayings and writings of some of the prominent women and men who from their long experience speak with authority on the subject of athletics for girls and women." Fifteen short articles, some of them abstracts, several resolutions, and a bibliography are included. 95 pp. 75c. (Apply to A. S. Barnes & Co., New York.)

Philadelphia Art Jury, 1929

The Nineteenth Annual Report discusses the action taken with regard to the more important building and bridge plans submitted to it, and lists those, including electric sign plans, on which final action was taken in 1929. 40 pp., illustrated. (Apply to Grace G. Haupt, Secretary, Room 121, City Hall, Philadelphia.)

Other Reports Received

CONCORD, N. H.—Annual Report, Board of Water Commissioners, 1929. 20 pp.

KEWANEE, ILL.—Auditor's and Municipal Officers' Annual Reports, year ending April 30, 1930. 51 pp.

MARQUETTE, MICH.—Reports, year ended December 31, 1929. 86 pp.

MONTREAL, QUE.—Financial Statement and Assessments, Montreal Metropolitan Commission. 49 quarto pp., in both French and English.

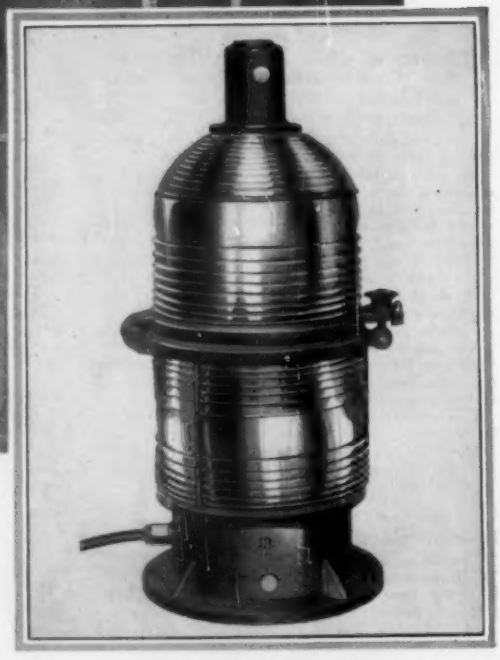
NEW ORLEANS, LA.—Semi-Annual Report, Sewerage and Water Board, 1929. 267 pp. plus a number of maps.

NEW YORK, N. Y.—Annual Report, Board of Water Supply, 1929. 95 pp.

TALLAHASSEE, FLA.—Annual Reports for years ending February 28, 1929, and February 28, 1930, and a Résumé of Ten Years of City Management Government. 88 quarto pp.

Let this light guard your water tower

YOUR water tower is not designed to withstand the tremendous impact that would result from being struck by an airplane. Such a collision would doubtless mean the loss of your water supply as well as the loss of life. And it is most likely to occur when visibility is poor—in fog, rain, or darkness. Hence, the need for this electric beacon. At night, it can be seen from miles around—from the ground as well as from the air. It guards your water tower, identifies your property, and promotes the safety of night air traffic. Ask your nearest G-E office for complete information. General Electric Company, Schenectady, N. Y.



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GENERAL ELECTRIC

SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance, other than local)

OCTOBER 6-10.—LONG BEACH, CALIF. (1,500)
California Conference on City Planning. Secretary, C. J. S. Williamson, Chamber of Commerce Building, Los Angeles, Calif. *Joint meeting with the League of California Municipalities.* Executive Secretary, William J. Locke, 1095 Market Street, San Francisco, Calif.

OCTOBER 6-7.—BISMARCK, N. DAK. (100)
League of North Dakota Municipalities. Annual meeting. Executive Secretary, Myron H. Atkinson, Bismarck, N. Dak.

OCTOBER, 6-11.—ATLANTIC CITY, N. J. (600)
National Recreation Association. Annual convention. Secretary, Howard S. Braucher, 315 Fourth Avenue, New York.

OCTOBER 6-11.—WASHINGTON, D. C. (2,500)
Permanent International Association of Road Congresses. Sixth International Road Congress. Secretary General, Thomas H. MacDonald, American Organizing Committee, 7123 N Street, N. W., Washington, D. C.

OCTOBER 7-10.—WASHINGTON, D. C. (2,500)
American Road Builders' Association. International Exposition of Highway Equipment and Material. Secretary-Director, Charles M. Upham, National Press Building, Washington, D. C.

OCTOBER 7-10.—MADISON, WIS. (1,500)
American Country Life Association. Conference. Executive Secretary, Benson Y. Landis, 105 East 22nd Street, New York.

OCTOBER 7-10.—WILMINGTON, N. C. (450)
Atlantic Deeper Waterways Association. Annual convention. Address the Association, Widener Building, Philadelphia, Pa.

OCTOBER 7-10.—RICHMOND, VA. (500)
Illuminating Engineering Society. Annual convention. General Secretary, A. B. Oday, 29 West 39th Street, New York.

OCTOBER 8-9.—SWAMPSCOTT, MASS. (200)
Massachusetts Police Association. Annual convention. Secretary, John H. Shaughnessy, West Newton, Mass.

OCTOBER 8-9.—MILWAUKEE, WIS. (200)
Wisconsin Chiefs of Police Association. Annual meeting. Secretary-Treasurer, R. H. McCarty, Police Department, Kaukauna, Wis.

OCTOBER 9-11.—LOUISVILLE, KY. (200)
International Association of Street Sanitation Officials. Annual convention. Secretary, A. M. Anderson, 100 North LaSalle Street, Chicago, Ill.

OCTOBER 10-16.—LOUISVILLE, KY. (500)
American Prison Association. Annual congress. General Secretary, E. A. Cass, 135 East 15th Street, New York.

OCTOBER 13-17.—RICHMOND, VA. (200)
American Society for Municipal Improvements. Annual convention. Secretary, C. W. S. Sammelman, 4359 Lindell Boulevard, St. Louis, Mo.

OCTOBER 13-15.—HENDERSONVILLE, N. C. (300)
American Water Works Association—North Carolina Section. North Carolina Sewage Works Association. Joint annual meeting. Secretary, H. G. Baity, School of Engineering, University of North Carolina, Chapel Hill, N. C.

OCTOBER 15-16.—ALLIANCE, NEBR.
League of Nebraska Municipalities. Annual meeting. Secretary, J. H. Hale, Kearney, Nebr.

OCTOBER 16-17.—SPRINGFIELD, ILL. (300)
Illinois Municipal League. Annual convention. Secretary, A. D. McLarty, Urbana, Ill.

OCTOBER 16-17.—CORNWALL, ONT.
Ontario Associated Boards of Trade and Chambers of Commerce. Annual meeting. Secretary-Treasurer, T. Marshall, Royal Bank Building, Toronto, Ont.

OCTOBER 19-22.—TULSA, OKLA. (325)
National Association of Commercial Organization Secretaries. Annual convention. Secretary-Treasurer, William J. Russell, Chamber of Commerce of the Borough of Queens, Long Island City, N. Y.

OCTOBER 20-23.—PHILADELPHIA TRI-STATE REGION, PA. (37)
American Civic Association, Inc. Annual meeting. Executive Secretary, Miss Harlean James, Union Trust Building, Washington, D. C.

OCTOBER 20-22.—HAYS, KANS. (300)
League of Kansas Municipalities. Annual convention. Executive Secretary, John G. Stutz, Lawrence, Kans.

OCTOBER 20-24.—KANSAS CITY, MO. (600)
National Tax Association. Annual meeting. Secretary, W. G. Query, Chairman, South Carolina Tax Commission. Columbia, S. C.

OCTOBER 21-23.—AMES, IOWA. (100)
Iowa Sewage Treatment Conference. Annual conference. Secretary-Treasurer, Lindon J. Murphy, Municipal Engineer, Iowa State College, Ames, Iowa.

OCTOBER 22-23.—ROANOKE, VA. (200)
League of Virginia Municipalities. Annual convention. Executive Secretary, Morton L. Wallerstein, 408 Travelers Building, Richmond, Virginia.

OCTOBER 25-27.—FORT WORTH, TEXAS. (45)
Conference of State Sanitary Engineers. Annual meeting. Secretary-Treasurer, R. E. Tarbett, United States Public Health Service, Washington, D. C.

OCTOBER 27, WEEK OF.—PINEHURST, N. C.
American Institute of Steel Construction, Inc. Annual convention. Executive Director, Charles F. Abbott, 285 Madison Avenue, New York.

OCTOBER 27, WEEK OF.—FORT WORTH, TEXAS. (800)
American Public Health Association. Annual meeting. Executive Secretary, Homer N. Calver, 370 Seventh Avenue, New York.

OCTOBER 29-NOVEMBER 1.—PASADENA, CALIF. (400)
American Water Works Association—California Section. Annual meeting. Secretary-Treasurer, L. L. Farrell, 2127 Adeline Street, Oakland, Calif.

OCTOBER 30-NOVEMBER 1.—CHICAGO, ILL. (100)
Civil Service Assembly of the United States and Canada. Annual meeting. Secretary, Fred Telford, 923 East 60th Street, Chicago, Ill.

OCTOBER 31-NOVEMBER 1.—OGDEN, UTAH. (325)
State Municipal League of Utah. Annual convention. Secretary-Treasurer, William A. Fraser, 414 City and County Building, Salt Lake City, Utah.

NOVEMBER 5-7.—CEDAR RAPIDS, IOWA. (75)
American Water Works Association—Missouri Valley Section. Annual meeting. Secretary, Earl L. Waterman, University of Iowa, Iowa City, Iowa.

NOVEMBER 6-7.—TORONTO, ONT.
Canadian Tax Conference of the Citizens' Research Institute of Canada. Convention. Director, Horace L. Brittain, 21 King Street, Toronto, Ont.

NOVEMBER 10-12.—CLEVELAND, OHIO.
Governmental Research Association. Annual meeting. Secretary-Treasurer, Russell Forbes, 261 Broadway, New York.

NOVEMBER 10-12.—CLEVELAND, OHIO.
National Association of Civic Secretaries. Annual meeting. Secretary, Nat Spencer, Citizens' League, Kansas City, Mo.

NOVEMBER 10-12.—CLEVELAND, OHIO.
National Municipal League. Annual convention. Secretary, Russell Forbes, 261 Broadway, New York.

NOVEMBER 10-12.—CLEVELAND, OHIO.
Ohio Municipal League. Meeting. Secretary-Treasurer, Professor Harvey Walker, Ohio State University, Columbus, Ohio.

NOVEMBER 10-12.—CLEVELAND, OHIO.
Ohio State Conference on City Planning. Annual meeting. Secretary, Gerald S. Gimre, City Hall, Youngstown, Ohio.

NOVEMBER 10-12.—CLEVELAND, OHIO.
Proportional Representation League. Annual meeting. Executive Secretary, George H. Hallett, Jr., 311 South Juniper Street, Philadelphia, Pa.

NOVEMBER 12-15.—CHARLESTON, S. C. (200)
National Association of Railroad and Utilities Commissioners. Convention. Secretary, James B. Walker, 270 Madison Avenue, New York.

NOVEMBER 13-14.—CLEVELAND, OHIO.
American Municipal Association. Annual meeting. Executive Secretary, John G. Stutz, Lawrence, Kans.

NOVEMBER 17-20.—PITTSBURGH, PA. (500)
American Association of State Highway Officials. Annual convention. Executive Secretary, W. C. Markham, 1222 National Press Building, Washington, D. C.

NOVEMBER 18-20.—NEW YORK. (200)
National Association of State Auditors, Comptrollers and Treasurers. Annual convention. Secretary, S. H. Blan, State Auditor, Montgomery, Ala.

NOVEMBER 19-20.—UNIVERSITY CITY, MO. (150)
League of Missouri Municipalities. Annual meeting. Executive Secretary, J. W. Lumpp, 6801 Delmar Boulevard, University City, Mo.

NOVEMBER 19-22.—WASHINGTON, D. C.
White House Conference on Child Health and Protection. General session. Chairman, Ray Lyman Wilbur, Secretary of the Interior, Washington, D. C.

DECEMBER 1-5.—MEMPHIS, TENN. (850)
The Asphalt Institute. Ninth Annual Asphalt Paving Conference. Managing Director, J. E. Pennybacker, Crystal Building, 801 Second Avenue, New York.

DECEMBER 1-5.—MEMPHIS, TENN. (850)
Association of Asphalt Paving Technologists. Meeting in conjunction with Ninth Annual Asphalt Paving Conference of The Asphalt Institute. Secretary-Treasurer, C. A. Mullen, 980 Saint Antoine Street, Montreal, Que.

DECEMBER 1-5.—NEW YORK.
American Society of Mechanical Engineers. Annual meeting. Secretary, Calvin W. Rice, 29 West 39th Street, New York.

DECEMBER 9-10.—WASHINGTON, D. C.
National Rivers and Harbors Congress. Annual congress. Secretary-Treasurer, S. A. Thompson, 824 Colorado Building, Washington, D. C.

DECEMBER 11-12.—WASHINGTON, D. C. (250)
National Research Council—Highway Research Board. Annual meeting. Director, Roy W. Crum, B and 21st Streets, Washington, D. C.

DECEMBER 12-13.—ASBURY PARK, N. J. (175)
New Jersey Public Health and Sanitary Association. Annual meeting. Secretary, Dr. Edward Guion, Box 418, Atlantic City, N. J.

JANUARY 12-16.—ST. LOUIS, MO. (25,000)
American Road Builders' Association. Annual meeting. Secretary-Director, Charles M. Upham, National Press Building, Washington, D. C.

JANUARY 12-16.—ST. LOUIS, MO.
American Road Builders' Association—County Highway Officials' Division. Annual meeting. Executive Engineer, Charles E. Grubb, National Press Building, Washington, D. C.

JANUARY 15.—NEW YORK.
American Society of Civil Engineers—City Planning Division. Annual meeting. Executive Secretary, Harold M. Lewis, 130 East 22nd Street, New York.

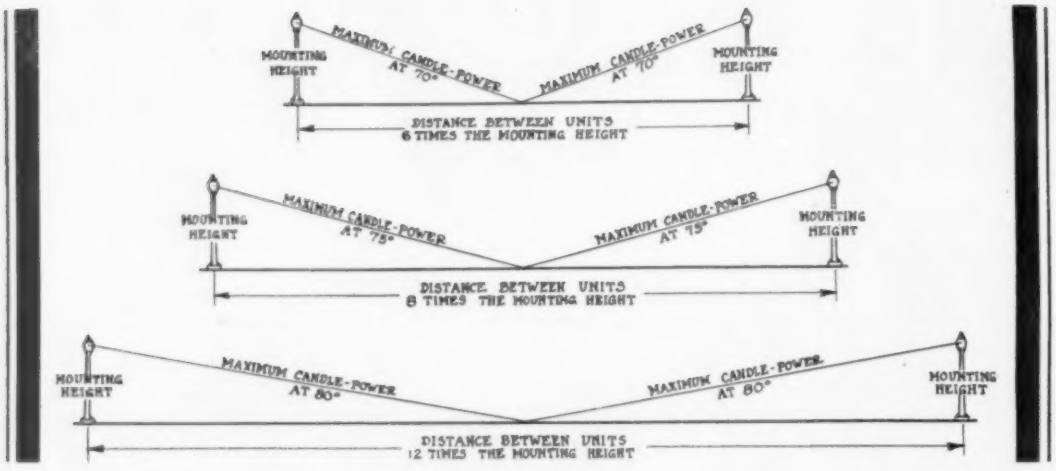
JANUARY 27-31.—NEW YORK.
American Institute of Electrical Engineers. Annual winter convention. National Secretary, F. L. Hutchinson, 33 West 39th Street, New York.

FEBRUARY 4-6.—PITTSBURGH, PA.
National Paving Brick Manufacturers Association. Annual meeting. Managing Director, G. F. Schlesinger, 1245 National Press Building, Washington, D. C.

APRIL 23-24.—ROANOKE, VA. (125)
Southern Commercial Secretaries' Association. Annual meeting. Secretary-Treasurer, Karl Lehman, Orange County Chamber of Commerce, Orlando, Fla.

MAY 4-9.—WASHINGTON, D. C. (2,000)
International Chamber of Commerce. Biennial meeting. John P. Gregg, Manager of the American Section, Connecticut Avenue and H Street, N. W., Washington, D. C.

How Should Street Lights Be Spaced?


MOUNTING HEIGHT
MAXIMUM CANDLE-POWER AT 70°
MAXIMUM CANDLE-POWER AT 70°
MOUNTING HEIGHT
DISTANCE BETWEEN UNITS 6 TIMES THE MOUNTING HEIGHT
MOUNTING HEIGHT
MAXIMUM CANDLE-POWER AT 75°
MAXIMUM CANDLE-POWER AT 75°
MOUNTING HEIGHT
DISTANCE BETWEEN UNITS 8 TIMES THE MOUNTING HEIGHT
MOUNTING HEIGHT
MAXIMUM CANDLE-POWER AT 80°
MAXIMUM CANDLE-POWER AT 80°
MOUNTING HEIGHT
DISTANCE BETWEEN UNITS 12 TIMES THE MOUNTING HEIGHT

AS SHOWN by the diagram above, the wider the light distribution of a lighting unit, the farther apart the units can be spaced.

For street lighting the spacing should not vary according to the type of horizontal distribution; that is to say, units with an asymmetric distribution need not be spaced differently from symmetric units. It is the *vertical* distribution of the light which should govern the spacing.

The usual setting of the lamp in a Holophane Refractor is such that the maximum candle power is obtained at 75 degrees in the vertical plane, as in the middle diagram above. With this vertical distribution, the maximum candle power strikes the street half-way between units when the spacing is 8 times the mounting height.

Other settings may be used for smaller or larger spacing ratios. Write for Data Sheet No. 8397 or any other engineering data.

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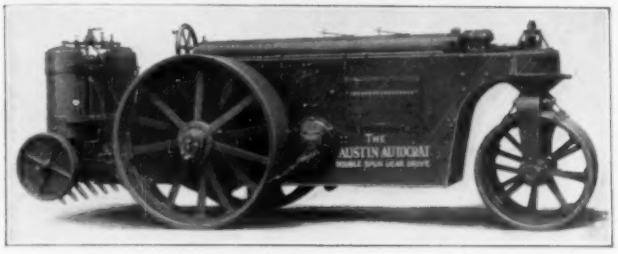
CLEVELAND CINCINNATI

NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings



THE AUSTIN AUTOCRAT ROAD ROLLER

An Improved Road Roller

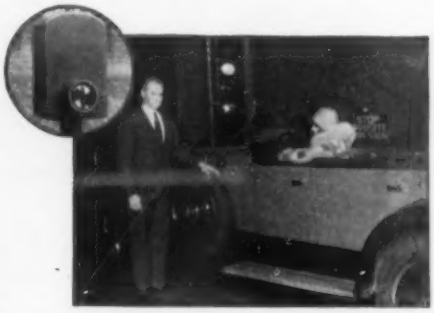
One of the outstanding features of the new Austin Autocrat road roller, recently announced by The Austin-Western Road Machinery Co., Chicago, Ill., is a double spur gear drive of exceptional efficiency. The improved roller has an unusually short wheelbase, which adds greatly to the roller's maneuverability in close quarters, and a low center of gravity insures smooth work by eliminating side sway.

The front rolls of the machine are 43 inches in diameter and have a combined width of 40½ inches. They are fitted with scrapers carried on lugs integral with the fork and held close to the rolls by spring pressure, which can be quickly adjusted to any desired tension.

The front axle is an accurately machined open hearth steel shaft which engages dowel pins at each end of the front fork and is held rigidly to the fork by caps and U-bolts, a method which greatly facilitates the maintenance of bushings and the taking-up of hub side wear. Each section of roll carries two heavy bronze bushings, between which is a large reservoir for oiling the axle.

The power unit consists of a heavy-duty 4-cylinder engine directly connected to, and forming a single unit with, the heavy-duty sliding gear transmission and the forward and reverse clutches. All engine and roller controls are centered around the roomy platform. A 4-lever panel secured to the dash contains the spark, throttle, choke and governor controls, while the oil pressure gage is located just below and to the right of this panel. The transmission change speed lever operates on a quadrant secured to the center of the dash. The clutch lever is pivoted to the left side of the dash plate, while the foot brake lever is pivoted to the front of the dash within easy reach of the operator. The steering wheel is conveniently located just below the top of the dash and, as the steering shaft passes under the hatches and through the upper radiator tank to the steering gear, the operator has equally good vision on both sides of the roller.

Other features of the roller are a large radiator with ample cooling capacity for the motor and for the scarifier air - compressor, a 30-gallon gasoline tank mounted close to the dash and high enough to provide gravity feed to the carburetor, a double-acting foot brake of the cam actuating type located on the third shaft of the transmission with lever conveniently located for the operator, and an unusually large toolbox beneath the foot plate, the lid forming a portion of the plate itself and provided with a padlock.



THE LIGHT THAT "SEES" AUTOMOBILES

A New Traffic Regulator

The light that "sees" automobiles as they approach the intersection of South and Coal Streets, Wilkinsburg, Pa., and turns on the green signal to go, is demonstrated by Dr. Phillips Thomas of the Westinghouse Research Laboratories, East Pittsburgh, Pa., who designed the light. This installation, believed to be the first of its kind in the world, is an adaptation of the photoelectric cell.

This signal has been in operation for over six months and is popular with the local residents as it eliminates the time wasted by the driver of a car on the main street, waiting for the light to turn green, when the side street is clear. With cars on both intersecting streets the green and red signals flash on a predetermined time schedule, as do ordinary traffic signals.

Reduction in Cost of Diesel Engines

By the expenditure of several hundred thousands of dollars for the most modern foundry and shop equipment, the Busch-Sulzer Bros.-Diesel Engine Co., St. Louis, Mo., has reduced the cost of its diesel engines without any sacrifice of quality. The company will continue to build in its trunk piston 4-cycle diesel, its bronze box hardened steel piston pin construction, which has practically eliminated wear on this bearing.

New Line of School Busses

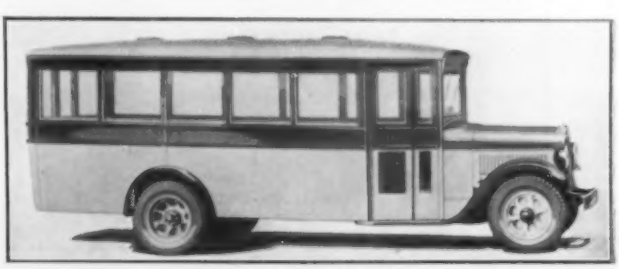
A complete new line of school busses, embodying advanced features of mechanical design and construction, together with many improvements in seating arrangement and other essentials for pupil transportation, has been announced by Dodge Brothers Corporation, Division of the Chrysler Corporation, Detroit, Mich.

Six models comprise the new line, the outstanding features of which are full-floating axles, heavier frames and chassis, dual rear wheels with balloon tires, fuel pumps, internal-expanding automatically equalized hydraulic four-wheel brakes, four-speed transmissions, powerful 6-cylinder engines on all models and double drop frames providing a lower center of gravity and greater lateral stability on the larger models. Each bus is engineered and built as a unit, the body and chassis being designed for each other.

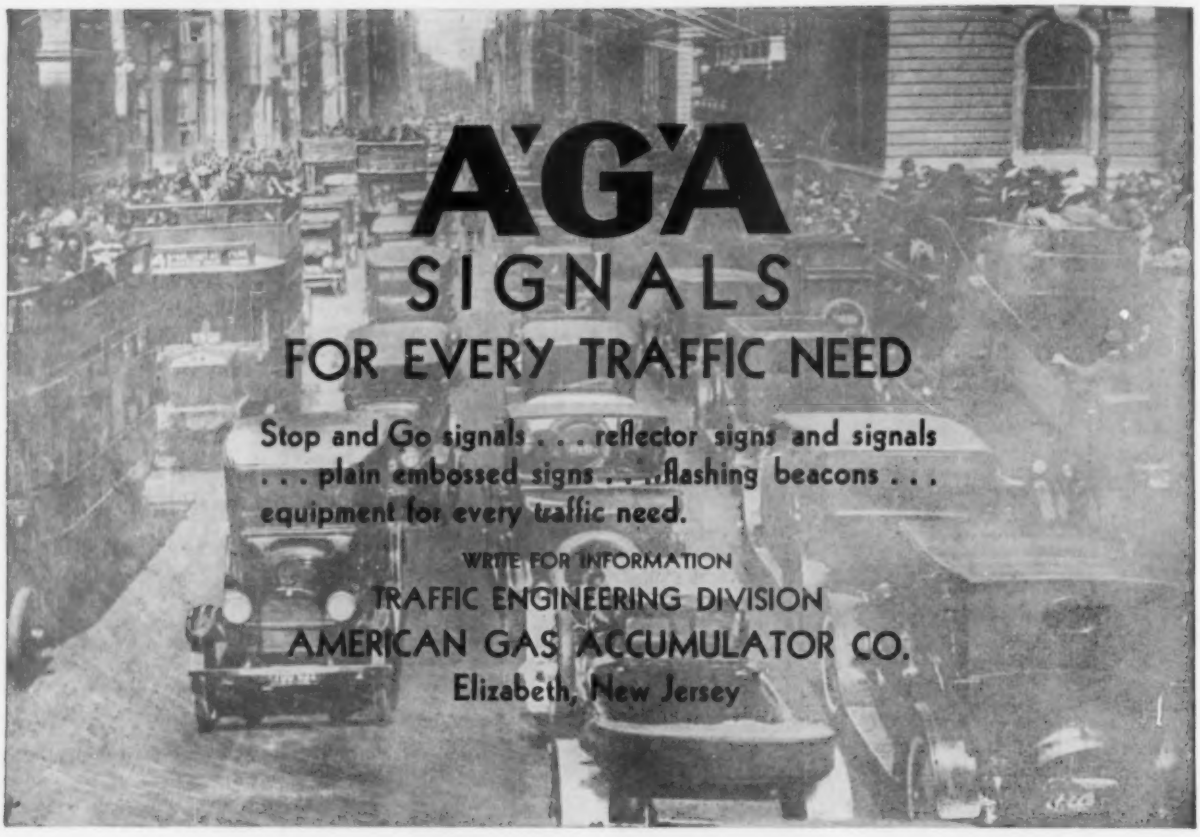
The Model 83 has a 140-inch wheelbase chassis and a capacity of from 25 to 31 pupils. The Model 84 has a capacity of from 31 to 40 pupils and is offered on a 165-inch wheelbase chassis.

Four different seating arrangements are designed for the Model 85, providing capacities for 21 to 58 pupils. This model, with its optional seating plans, has been found particularly well adapted to the transportation of athletic teams, debating clubs, etc., in addition to carrying pupils to and from school.

Particular attention has been paid to the achievement of attractive, pleasing lines, as well as to proper distribution of weight, ease of entrance and exit, ample ventilation, clear vision, spacious head room, aisle space and leg room.



THE NEW DODGE SCHOOL BUS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SIGNALS
FOR EVERY TRAFFIC NEED
Stop and Go signals . . . reflector signs and signals
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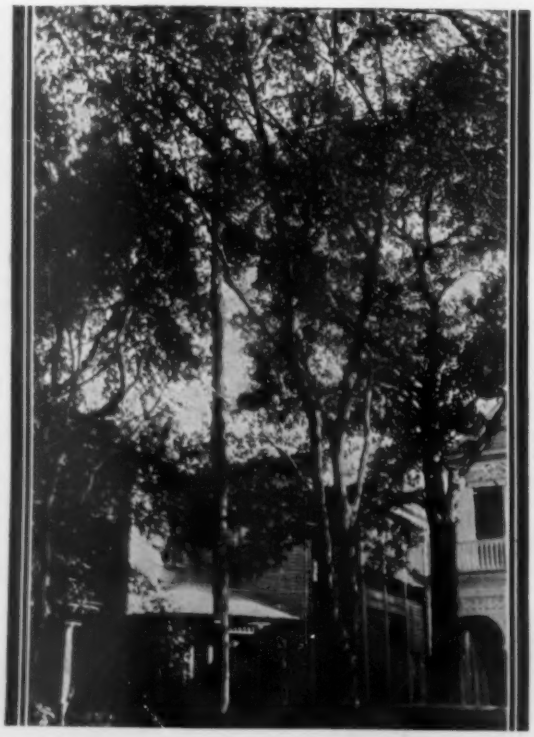
equipment for every traffic need.
WRITE FOR INFORMATION
TRAFFIC ENGINEERING DIVISION
AMERICAN GAS ACCUMULATOR CO.
Elizabeth, New Jersey



FIBREX
TREE WIRE

Safety Insurance Against Storms

Right now conditions are favorable for the line gang to make a thorough check-up of your lines. Particularly should wires that run through trees be closely inspected for bare spots or places that are badly worn. Every time one is found FIBREX Tree Wire should be spliced in. Only in this manner can swinging grounds and short circuits be prevented.

FIBREX is inexpensive to put up. It saves the cost of trimming trees. It will not injure trees. It is more permanent than any other type of tree protection. It builds goodwill for the utility companies upon whose lines it is installed.

Every distribution engineer should have a piece of FIBREX Tree Wire for examination. A short piece with full information will be sent promptly upon request.

SIMPLEX WIRE & CABLE Co
MANUFACTURERS
201 DEVONSHIRE ST., BOSTON
BRANCH SALES OFFICES
CHICAGO, 564 W. Monroe St. SAN FRANCISCO, 390 Fourth St.
NEW YORK, 1328 B'way CLEVELAND, 2019 Union Trust Bldg.
PHILADELPHIA, 1227 Fidelity-Philadelphia Trust Building
JACKSONVILLE, 1010 Barnett National Bank Building

Second Series of Treatment Plant Booklet

The Second Series of "Modern Sewage and Water Treatment Plants" has recently been issued by the Dorr Company, 247 Park Avenue, New York. A similar booklet was prepared last year and was so popular among sanitary engineers that it is the intention of the company to publish these booklets regularly, showing different plants in each booklet.

The present booklet contains photographs of representative installations in Aurora, Ill.; Regina, Sask.; Saginaw, Mich.; Horton, Kans.; Petoskey, Mich.; St. Louis, Mo.; Tucson, Ariz.; Piqua, Ohio; Middletown, N. Y.; Fort Worth, Texas; Aurora, Colo.; Cedar Rapids, Iowa; Lake City, Fla.; Fond du Lac, Wis.; Bloomington, Ill.; Alliance, Ohio; Dayton, Ohio; Topeka, Kans.; Dunsmuir, Calif.; East Rochester, N. Y.; Sedalia, Mo.; Parsons, Kans.; Tenafly, N. J.; Madison, Wis.; DeKalb, Ill.; Marion, Ohio; Trenton, N. J.; Fostoria, Ohio; Klamath Falls, Ore.; Wisconsin Rapids, Wis.; Lawton, Okla.; Urbana, Ill.; Red Bank, N. J.; and High Point, N. C., with a brief description of each plant and of the applications of Dorr equipment to the various methods of treatment used.

A New Fire-Alarm Horn

Many cities are now closing down their steam plants and changing over to central-station electric power. With this change, the old steam fire whistle becomes obsolete. In such cases, a Federal-Tyfon compressed-air-operated horn of equal or greater tone capacity, made by the Federal Electric Co., 8700 South State St., Chicago, Ill., can be installed with decided advantages over the steam signal.

This horn has just four parts, a bronze diaphragm, the gun-metal horn and diaphragm holder in one piece, a fixing screw ring or cover and an operating valve. It is made in several sizes, two of which are generally recommended, the No. 200 and the No. 300, the difference between the horns being a matter of volume and tone. The No. 300 has a lower tone and consequently covers more area than does the No. 200 and is a larger horn. Ordinarily the No. 200 is satisfactory for communities with 5 to 10 thousand population. The No. 300 is for larger cities, although local conditions may change these recommendations.

The same simplicity is found in the Federal-Tyfon fire-alarm system as in the horn itself. It is composed of the air compressor, necessary control valves, the Federal-Tyfon horn, a central station transmitter and a fire-alarm box or boxes. Local conditions determine the best arrangement of the parts; the storage tank may be vertical or horizontal and the horn may be mounted on a steel tower or on brackets.

STREET NAME SIGNS

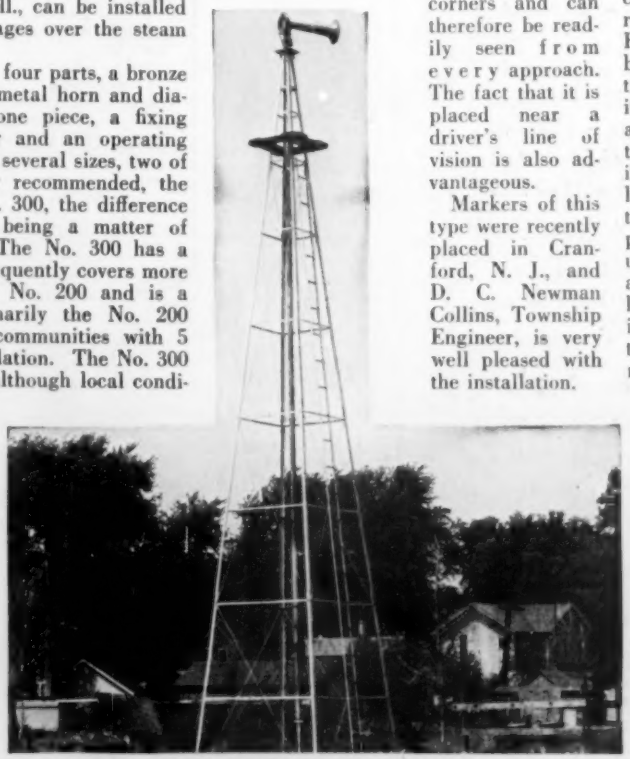
Frost-proof Faience Letters for Street Name Signs

A new type of street name signs which last indefinitely without the necessity of repairs or repainting, has been brought out by the Mueller Mosaic Co., Trenton, N. J.

These signs consist of letters which can be executed in any desired color and which are made of frost-proof faience. This company furnishes the letters only, which are designed for setting in locally made concrete posts.

One of the advantages of this type of sign is that it can be economically installed on all four corners and can therefore be readily seen from every approach. The fact that it is placed near a driver's line of vision is also advantageous.

Markers of this type were recently placed in Cranford, N. J., and D. C. Newman Collins, Township Engineer, is very well pleased with the installation.



FEDERAL-TYFON HORN MOUNTED ON 60-FOOT STEEL TOWER AT ROCHELLE, ILL.

New Gamewell Sales Engineers

The Gamewell Co., Newton, Mass., has announced the addition of W. B. Barber and E. E. Brown to the Gamewell staff as Sales Engineers. Mr. Barber will be located in the New York office at 70 East 45th Street, and will handle sales work in part of New York and Pennsylvania. Mr. Brown is now located in the Boston office at 1022 Commonwealth Avenue, and will operate in the Boston metropolitan area.

International Filter Co. Moves General Office

The International Filter Co., manufacturer of water-softening and filtration plants for municipal, industrial and domestic supplies, has moved its general office to 59 East Van Buren St., Chicago, Ill. The company's laboratory remains at its old location on 25th Place, Chicago, and samples for analysis should be sent directly to Laboratory, International Filter Co., 329 West 25th Place, Chicago, Ill.

A New Method of Diffusing Chlorine

There are, in general, two ways of applying chlorine gas for the sterilization of water or the disinfection of sewage. These are: the dry-feed method, by which the gas is applied directly, and the solution-feed method, in which an auxiliary water-supply is used to first dissolve the chlorine.

With the new Paradon dry-feed impulse type diffusor made by the Paradon Mfg. Co., Arlington, N. J., the chlorine or other gases are applied directly to water, sewage or other liquids. However, instead of depending upon the bubbling toward the surface for absorption, a stream of water under high velocity is played on the rising bubbles of gas, accomplishing four purposes. It causes the gas bubbles to take a horizontal path instead of a vertical path, thereby greatly increasing the area of contact with the water or sewage to which it is applied. The high-velocity stream minutely divides the bubbles, increasing the area of contact, and, the size of the gas bubble being much smaller, its buoyancy is much less and it will, therefore, rise to the surface at a slower rate and again more contact with the water or sewage is obtained. Finally, the high-velocity stream of water produces violent agitation of the water or sewage adjacent to the point of gas application, once more effecting a greater contact between the gas and the water or sewage being treated.

Sewage or other liquids may also be used to operate the impulse diffusor, if desirable.

At one installation using this new device, 200 pounds of chlorine were applied per 24 hours. The water required to operate the diffusor in this case amounted to only 360 gallons per hour, compared with approximately 10,000 gallons per hour ordinarily required for the corresponding solution feed units.

RAIN RESTORES Their Lovely COLORING

The beautiful coloring in American Marbelite Standards does not grow dingy and lifeless with time.

The surface is so smoothly polished that rain easily washes away the dust, keeping its colors fresh and lovely —year after year.

—but weathering and rain do not affect the sturdiness of these lighting Standards. They last a lifetime. They are centrifugally cast of Granite Concrete upon a reinforcing cage of fabricated steel, spot-welded into one piece.

Guaranteed against defects in material or workmanship.

Insured for 3 years against damage by collision.

PAUL K. FLEMING
Vice-President and General Manager

AMERICAN CONCRETE MARBELITE CO.
American Concrete Products Co.
Chicago Concrete Post Co.
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4727 NORTH LAMON AVE. CHICAGO, ILLINOIS

FIRE HOSE SPECIALISTS

—doing one thing and *doing it well*

If you have had experience with our Wax and Para Gum Treated Fabric, Rubber Lined Fire Hose, we need no better testimonial than its record in your service.

If you have not used it, why not try it and be convinced?

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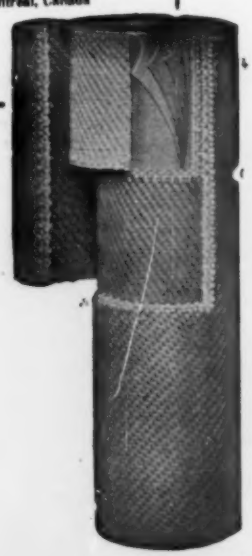
Dallas, Texas	Pittsburgh, Pa.
Portland, Ore.	Bloomfield, N. J.

Montreal, Canada



An Illuminated Signal Sign

A recent analysis of the traffic deaths in some of the largest cities is summed up in the report of one typical American city. Of the 286 accidents which occurred during an average month, 113 took place between five and ten o'clock in the evening. Failure to observe or obey traffic regulations accounted for most of the resulting 98 deaths.

Eaglelume signal signs, made by the Eagle Signal Sales Corporation, Moline, Ill., eliminate this danger, as they are illuminated and can therefore be readily seen at night. These signs are made of two enameled porcelain plates with opalescent white, amber or red glass, the back of each plate being enameled white to serve as a reflector for the opposite side. The frame is made of 18-gage steel, bent to form a channel, and the entire sign is made of three parts. The plates are removable, being held by four screws tapped in the frame. A weatherproof strip over the top of the frame keeps out the snow, rain and dust, and also holds the top of the plates in place. One plate has the traffic order punched or pierced through it, and the opposite plate may have the name of the highway, names of streets or any other marking desired.

In this way a motorist approaching an arterial street or highway from an intersecting one, will be warned of the stop regulations by the sign on the near side of the intersection at the right, while the reverse side of the sign on the diagonally opposite corner will show the names of the intersecting streets or other directions.

Each sign has two lamps, so that if one burns out, the other will give the signal. The cable comes through the base casting up to a cut-out base which has two plugs. From the base the wires go to the flasher, and from the flasher to the two sockets on each side at the top of the signal. These sockets are so placed as to illuminate the letters and not to show any spot of light through the glass.

EAGLELUME SIGN ON NEARSIDE OF STREET INTERSECTION AT RIGHT

REVERSE OF SIGN ON DIAGONALLY OPPOSITE CORNER, SHOWING NAME OF HIGHWAY AND DIRECTIONS

Water, Gas and Sewer Pipe Repair Sleeves

The ordinary method of repairing cracked water pipe requires shutting off the supply, draining a large portion of the distribution system and cutting in a new section of pipe. By the use of Kellogg repair sleeves, made by the New Brunswick Iron Works, New Brunswick, N. J., this is unnecessary, as the sleeve can be installed as soon as the pipe is exposed, without inconvenience to consumers or interruption of fire service.

After the cracked or broken pipe has been uncovered, the section of sleeve having the plugs in the side is placed under the pipe, and the other section is then placed on top with a gasket between the sections. The plugs should be removed from the lower section before it is placed under the pipe, so that the leakage may run out while the sleeve is being adjusted. The bolts in the flanges are then screwed down tight and the joints at each end are leaded and calked.

The amount of water running from a cracked pipe is usually small and the holes in the bottom section of the sleeve will discharge it all. Should the pressure of the water flowing from these holes be so strong as to prevent screwing in the plugs after the sleeve is installed, an open stop or corporation cock may be inserted in place of the plugs and turned off by hand after the work is completed.

These sleeves are made in both bell and straight types, the bell sleeves for use in the middle as well as in front of or behind the bell of a pipe, while the straight sleeves are for use only in the middle of the pipe.

New Glamorgan Representative

The Glamorgan Pipe & Foundry Co., Lynchburg, Va., has announced the appointment of Frank Grossman as special representative of the company, with headquarters at 812 Peoples Gas Building, Chicago, Ill.

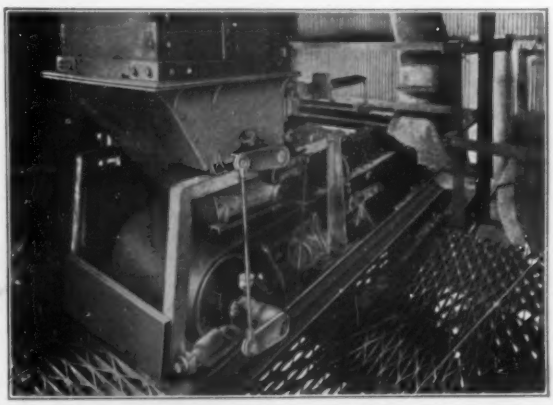
The Use of the Poidometer in Water-Works

The Poidometer, a precision machine designed to feed bulk material by weight in a steady, uniform, constant stream, has recently been adapted to use in water-purification plants by the Schaffer Poidometer Co., 2818 Smallman St., Pittsburgh, Pa.

In operation, the scale beam is set at whatever amount of material may be required per foot of belt travel, the gate is then adjusted to suit this weight and the machine will deliver the predetermined amount of material with accuracy.

At the present time, there are three Poidometers being used in water-purification plants, two for weighing and feeding lime at the Dallas, Texas, city water plant, and the other at the Fridley filtration plant of the city of Minneapolis for weighing and feeding alum into their purification systems.

The apparatus is self-contained, mounted on a substantial steel frame, and all bearings are of the highest quality. The weighing apparatus is of the best construction, being equipped with dust-proof ball bearings and all pivot points and knife edges in connection with the beams are case-hardened. The hopper is made of cast iron and is of a special type so arranged that the belt in passing under it pulls the material from the hopper instead of the hopper spilling the material onto the belt. Two shoes, one on each side of the hopper and set at the proper angle, further assist and cause the materials handled to be delivered onto the belt in the form of a ribbon wherein the angle of repose is determined the instant the belt receives the material from the hopper. The regulating gate on the hopper has double knuckle joints and is connected to the scale beam by case-hardened pivot points and case-hardened knife edges. The hopper gate has an action which is free, practically eliminating friction.



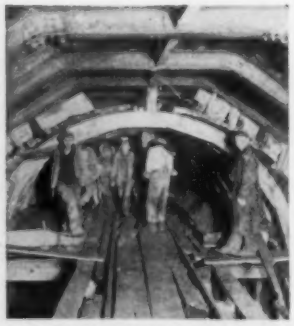
A TYPICAL INSTALLATION OF A 20-INCH BY 4-FOOT 6-INCH POIDOMETER

3-10 of a cubic foot of Celite per bag of cement was used in placing the 100,000 cu. yds. of concrete poured on the Suisun Bay Bridge to be completed late this year.

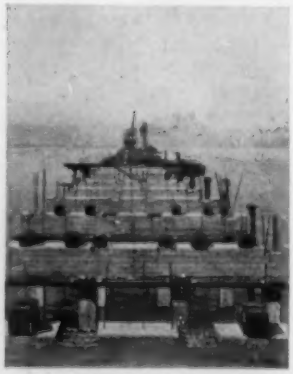
On these BIG jobs . . .

CELITE has been used *because it assures* BETTER CONCRETE . . *at less cost*

IN BUILDING THE CASCADE TUNNEL, the longest in America, Celite added to the concrete made possible unusual time records in the placing of the lining. 90 ft. of completed lining, or about 425 cu. yds. of concrete were placed per calendar day. 2% of Celite added to the concrete—a 1-2-4 mix—by increasing workability assured rapid, easy placing by the chutes and concrete gun.



CELITE-CONCRETE was hauled 6¼ miles and then placed to make a perfect job on the lining and portals of this tunnel of the Connellsville Extension of the P. & W. Va. Ry.



625 TONS OF CELITE were used to speed up the work on the San Francisco Toll Bridge and to insure the watertightness and resistance to sea water necessary in this construction.

750 tons of Celite were used to expedite the concrete work on the Suisun Bay Bridge of the Southern Pacific Railroad, now nearing completion in California. The Cascade Tunnel . . . the San Mateo Bridge across San Francisco Bay . . . the Broad Street Subway in Philadelphia . . . the Buckingham Memorial Fountain, Chicago, Ill. . . . the Packard Motor Speedway . . . are other outstanding examples of concrete construction in which Celite was used to increase workability.

Why Celite will reduce costs and improve concrete work—told in the Booklet

Our booklet recently issued explains why "dry" concrete containing Celite can be chuted as far as 700 ft. and placed as easily as if the mixer were right over the forms—how Celite by fattening the mix will increase the life of pipe bends 500% in concrete gun work—how the addition of Celite* has insured water-tightness and uniformity, improved appearance and reduced finishing costs—and finally how, in many jobs, the increased yield of finished concrete alone, pays for the use of Celite. The coupon below will bring this booklet to you.

**Most concrete mixes require only 0.3 cubic feet of Celite per bag of cement.*

Address JOHNS-MANVILLE
292 Madison Ave., New York
If West of Rocky Mountains, address
159 New Montgomery St., San Francisco, Cal.
Canadian Address: Johns-Manville, Toronto
Please have a J-M Concrete Engineer call.
Please send me a copy of your Celite for Concrete Booklet—CC-1-A-1

Name .....

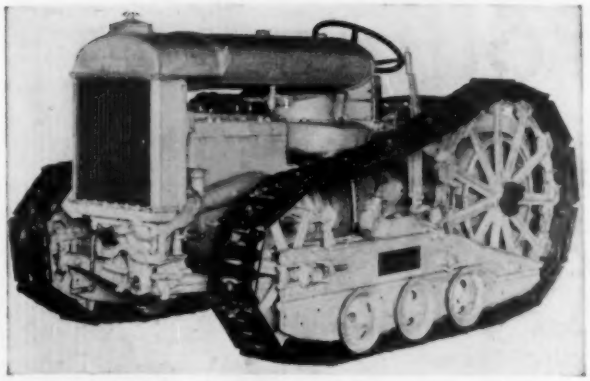
Address .....

CC—125—10

Johns-Manville

CELITE FOR CONCRETE

Asphalt Plank — Expansion Joints — Waterproofing



MODEL F TRACKSON CRAWLERS FOR THE NEW FORDSON

A Crawler for the New Fordson

A new crawler unit which has many advantages over wheel tractors, such as sure footing and positive traction in all kinds of ground conditions, additional weight for bearing down on hard pulls, increased power, shorter turning radius and great flexibility, has been developed by the Trackson Co., Milwaukee, Wis., for the new Fordson tractor, converting it into a powerful, all-steel 2-ton crawler tractor.

Proper weight and balance and a track area of 1,100 square inches contact with the ground enables this new Model F Trackson crawler to hug the ground and develop tremendous pulling power. Most important of all is its ability to work equally well in soft, loose soil conditions, mud or sand, swamp land, or snow. Its light ground pressure, less per square inch than the pressure exerted by a man's foot, enables it to travel lightly over soft surfaces where wheel tractors or teams would mire, and its ground-gripping crawler tracks give it a firm foothold where the way is steep or otherwise bad going.

The crawlers may be quickly and easily installed by any mechanic, it being merely a matter of removing the wheels and attaching the crawler with no special fitting, drilling or machine work required. No differential changes are necessary and there are no intricate parts to complicate the steering or operation of the tractor.

They are built entirely of steel and have few working parts to wear out or break down. The tracks are made of heavy electric alloy steel castings, heat-treated and hardened to provide extra strength and resistance to wear. Positive protection against sand and dust prolongs the life of all bearings and the patented truck-wheel bearings are provided with a special oil reservoir and are of ring-oiling design, making lubrication certain and easy.

New Manager of Tubular Sales for Byers

In announcing the appointment of M. J. Czarniecki to the newly created position of Manager of Tubular Sales, H. W. Rinearson, Vice-President, A. M. Byers Co., Clark Building, Pittsburgh, Pa., stated that departmentalizing sales activities was necessitated by the proposed expansion program of the company to broaden the market for the use of wrought iron in forms other than pipe.

Mr. Czarniecki joined the Pittsburgh sales organization of the company in 1913 and the following year was assigned to the New York office, where he remained until his transfer in 1915 to Chicago. After the war, he returned to Chicago as District Manager and the following year was transferred to New York, where he remained as District Manager until 1925, when he was appointed Assistant General Manager of Sales with headquarters in Pittsburgh.

New Large-Capacity Bucket Loader

As an addition to its standard line of crawler and wheel-type bucket loaders with capacities ranging from 1 to 1¾ yards per minute, the Barber-Greene Co. of Aurora, Ill., now announces a new large-capacity super loader, the Model 62 crawler-mounted bucket loader. This new machine has a height of 19 feet 4 inches, a clean-up width of 7 feet 6 inches, and a capacity of 2 cubic yards a minute. It is a crawler-mounted, power-propelled, one-man loading unit, and is designed for work wherever loose bulk material needs to be handled, its great height and high capacity making it a very efficient tool for loading trucks in pits and its strong disc feeding arrangement making it usable for trimming subgrade on road jobs.

It can feed from the bank or from stock piles and, when equipped with one of several different types of Barber-Greene proportioning hoppers, it is excellent for batching on paving jobs. It may also be had with a grizzly or power-vibrated screen.

The machine has centralized control, steering levers, master clutch pedal, transmission shift lever, power-boom hoist lever, bucket line drive lever, crawler speed change lever and scraper hoist wheel, all being centered about the operator's platform. Although much greater in size and capacity, the Model 62 may be operated by one man as easily as one of the lighter loaders.

The patented overload release sprocket insures against strains due to overload. It is built in two parts, the outer rim which carries the drive chain and the inner part which is keyed to the head shaft that drives the bucket line and is held against the outer rim by two strong springs. When too great a load is placed on the buckets, the springs compress, allowing the outer rim to turn without having any effect on the bucket line. A similar safety sprocket is used on the crawler drive shaft in this model, tripping only when the power transmitted is excessive and thus protecting the crawlers and machinery from damage.

The loader feeds itself by means of two large 42-inch discs that revolve inward toward the buckets. These discs are flat on the ground and slide under a pile or into a bank. They crowd enough material onto the buckets to keep the machine working at a 2-yard-a-minute rate and yet, by their construction, are not dangerous to workmen. The floating, adjustable scraper cleans a path 7 feet 6 inches wide, an important feature in loading from stock piles where a clean pick-up is desired.

The patented floating boom is designed so that the thrust from the feeding end is transmitted direct to the crawlers and the power from the crawlers is used most efficiently.

BARBER-GREENE MODEL 62 SUPER LOADER

Controlling Traffic calls for Motorcycle Police

AMERICA'S POLICE MOTORCYCLE

TRAFFIC congestion, growing worse all the time, requires the mobility of Motorcycle Police to keep it in check.

The motorcycle men can be rushed out to the street and highway intersections where traffic always jams up on holidays and in rush hours. No "squad cars" or foot patrolmen can compare in efficiency and usefulness with these swift riders of the law. No police force is complete without a Motorcycle Detachment.

For police service of all kinds the Harley-Davidson has long been the outstanding motorcycle. More of this famous make are in police use than all other makes put together. And the greatest motorcycles Harley-Davidson has ever built for police work are the 1931 models recently announced.

Let your local Harley-Davidson dealer show you the features and improvements of the 1931 Twins.

Write us direct for illustrated booklet.

HARLEY-DAVIDSON MOTOR CO., Dept. M, Milwaukee, Wis.

HARLEY-DAVIDSON

The Police Motorcycle

HARLEY-DAVIDSON
9-Point Police Service

1. Controls traffic
2. Patrols outlying areas
3. Pursues law-breakers
4. Makes emergency calls
5. Curbs illegal driving
6. Enforces parking ordinances
7. Guards school crossings
8. Releases foot patrolmen
9. Leads parades and escorts

Write for this booklet *— it shows and describes fully the great 1931 models of America's Police Motorcycle.*

FRANCIS P. HERSEY

Another Hersey Joins Water-Meter Company

Francis P. Hersey, son of Walter A. Hersey, President of the Hersey Manufacturing Co., South Boston, Mass., has recently joined this well-known water-meter manufacturing organization. He is the third direct descendant of Francis C. Hersey, one of the founders of the company, which began its operations in 1858. Francis P. Hersey was captain of the Princeton golf team in his senior year, 1930, when the team won the Intercollegiate Golf Championship.

A New Method of Sewage Disposal

A new method of sewage disposal particularly applicable to trade wastes and packing-house sewage has been developed by the staff of chemists and engineers of George A. Hormel & Co., Austin, Minn. Packing-house sewage is usually regarded as much stronger than ordinary sewage waste. Large quantities of salt are used in meat curing, thus giving the sewage a strong chlorine content. Salt or chloride is a natural sterilizer and in a disposal system inhibits bacterial growth which is necessary for the digestion of the sewage. Another difficulty which most present methods encounter is the fact that sewage contains organic matter in suspension as well as in solution, both of which must be removed for complete success.

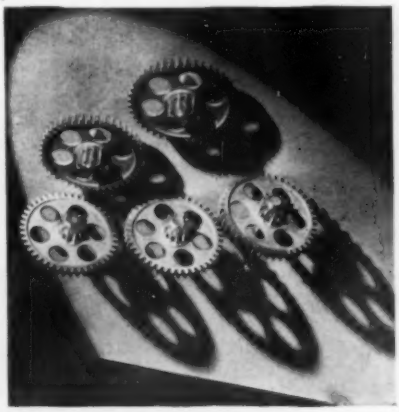
The Hormel process, which has been patented, is based on two major premises: (1) sewage treatment must generate oxygen in the sewage, thus building up the oxygen content of the river instead of pulling it down; (2) sewage treatment must recover something of value from the sewage sludge. Experiments showed that the addition of chlorine gas in excess quantities precipitates or coagulates all organic matter, both in solution and in suspension, into a compact sludge, similar to the way milk is curdled in souring. The removed sludge may be recovered in a simple manner which permits dewatering readily and inexpensively.

Since by this method only a gas is added to the sewage, the resultant sludge contains no element other than the organic matter originally held in solution or suspension. The sludge dries rapidly, does not become putrid, according to the chemists of George A. Hormel & Co., and because of the slight chlorine odor repels, rather than attracts, flies. When thoroughly dried, the sludge is odorless and contains a high protein content, making it of value as tankage and fertilizer, helping to pay the cost of operation. It is also stated that the effluent from this process contains more oxygen than is usually found in river water, thus materially benefiting plant and fish life in the diluting stream.

Chromium-Shell Gears for Meters

Of interest to water-works superintendents and others are the new letters patent recently issued to the Buffalo Meter Co., 2902 Main St., Buffalo, N. Y., which give this company the exclusive right to manufacture water-meter gears whose outer shell is chromium, one of the hardest metals known.

This feature consists of a hard outer shell of chromium covering the bronze core of each gear. The external dimensions of the finished gear remain the same and are completely interchangeable with the solid bronze gears formerly used. This feature gives each gear a surface harder than steel or glass, making them proof against wear.



CHROMIUM-SHELL GEARS AS USED IN BUFFALO METERS

The smooth chromium surface is perfectly lubricated in water, making any oil or other lubricating agents unnecessary, and the bearings are water-lubricated by patented enclosed rubber or jewel bearings.

Chromium is impervious to any corrosive action of chemicals found in water, making the gear-train proof against all kinds of hard-water corrosion and, since the chromium shell does not wear through, this protection against corrosion lasts for the life of the meter. In addition, the chromium shell gear train is sanitary and there is no possibility of contamination of the water by any part of the meter containing it.

The interchangeability of these gears with the former solid bronze gears makes it possible for old meters to be brought up-to-date by simply inserting the new gears. The gear plate and gear frame need not be changed.

Cook Opens Michigan Office

A. D. Cook, Inc., Lawrenceburg, Ind., manufacturer of deep-well pumps and well supplies, has opened a Michigan office at 715 Association of Commerce Building, Grand Rapids. James R. Hamilton is the sales representative in charge, and H. B. Allen Sickel, formerly Vice-President and Chief Engineer of the Layne-Ohio Co., is the consulting engineer and superintendent of gravel-packed well installations.

Yeomans Appoints Porto Rican Representative

Yeomans Brothers Co., Chicago, Ill., have recently appointed C. Calor Mota to handle the exclusive representation of Yeomans sewage and drainage pumping equipment in Porto Rico. His offices are located in Mayaguez, Porto Rico.

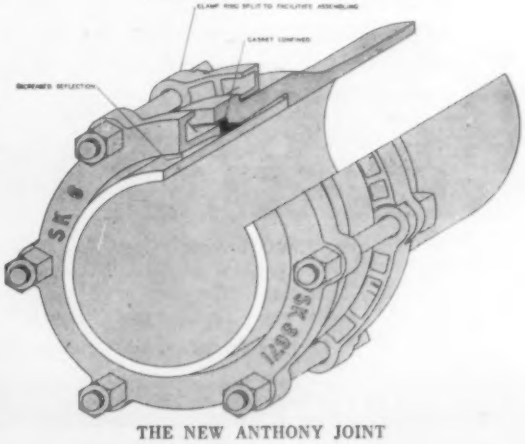
A New Type of Joint for Cast Iron Pipe

A new type of joint, known as the Anthony joint, primarily designed for high-pressure gas service and embodying the more favorable features of other types of joints, has been brought out by the United States Pipe & Foundry Co., Burlington, N. J. The latest design was developed after a careful survey of the gas industry and after obtaining suggestions for improvement and design from many users of the pipe.

The standard Anthony joint is the same for deLavaud pipe, pit cast pipe or fittings, and the accessories are all interchangeable. High resistance to corrosion, due to the fact that all parts are of certified malleable or cast iron, high deflection, ease of assembly, tightness under high gas pressures, only one gasket per joint, and its qualities as an expansion joint are some of its outstanding characteristics.

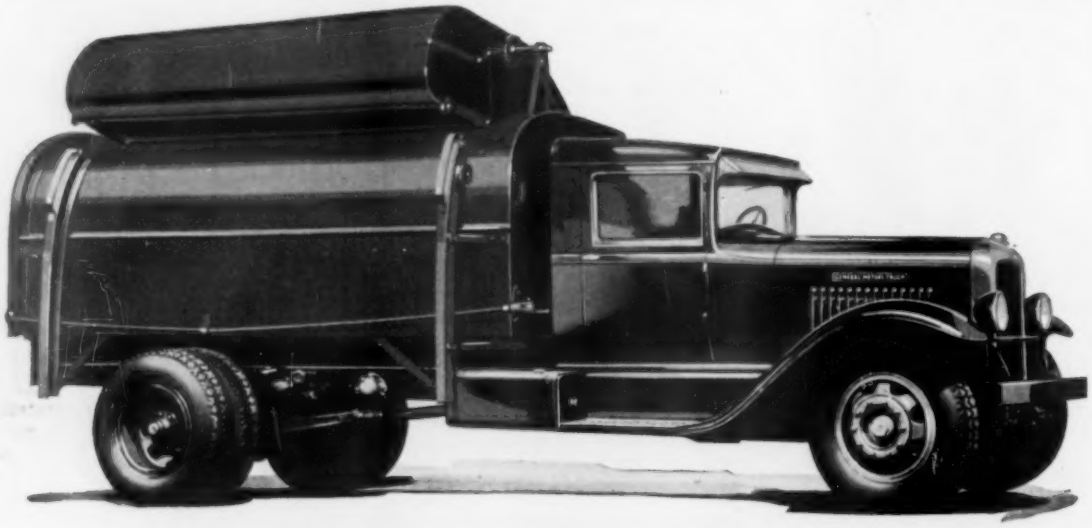
Plain rubber, duck-tipped, lead-tipped, asbestos-tipped or all asbestos gaskets can be furnished as desired.

It is easy to install, it being necessary only to put the gasket in place and tighten up the bolts and the joint is complete.



THE NEW ANTHONY JOINT

THIS RUGGED, POWERFUL TRUCK



$3985—4 TON RANGE

Model T-82 B
Price, Chassis Only, F. O. B. Pontiac, Mich.

THIS model comes in four wheelbases—155″, 167½″ (illustrated), 185¼″, and 201″—and 12 different tire combinations. Chassis prices vary according to wheelbase and tire equipment. Straight Rating—22,000 lbs.—total gross weight including load. Standard gear ratio 10.33 to 1. Optional (without extra charge): 9.00 to 1; 12.33 to 1. Five speeds forward, two in reverse.

. . . *Thrives on Tough, Hard Duty!*

THE GREAT, 94-horsepower, 6-cylinder engine in the General Motors Truck, Model T-82, gives it tremendous *tractive ability*.

You'll see it walk up out of a gravel pit, for example, with a smooth surge of power, while huge, awkward, old type trucks flounder and buck, wheels spinning, leaving a lot of tire mileage in the pit.

And its smooth, safe speed eats up the miles under load. It is a matter of actual record that this unit frequently does twice as much work as slow, obsolete vehicles still marketed for heavy duty. At savings of 50% *upward* in operating costs.

All performance and economy factors are in correct and absolute *balance*. There is brute strength throughout its construction—to match the power output of the engine.

Put it on the toughest job you've got and it will lick it *and keep it licked for years*.

The price passes on to truck users big savings resulting from the tremendous advantages of General Motors Trucks in volume production, large scale purchasing, and unusual resources.

SEE AND INVESTIGATE THIS GREAT LINE OF MODERN TRUCKS BEFORE INVESTING A DOLLAR IN NEW EQUIPMENT.

GENERAL MOTORS TRUCKS

TIME PAYMENTS, on any General Motors Truck, are financed at lowest rates available anywhere, through our own Yellow Manufacturing Acceptance Corp.
GENERAL MOTORS TRUCK CO., Pontiac, Michigan (*Subsidiary of* Yellow Truck & Coach Mfg. Company) GENERAL MOTORS TRUCKS . . . YELLOW CABS . . . COACHES.

Factory Branches, Distributors, Dealers—in over 2,000 principal cities and towns.

PRODUCT OF GENERAL MOTORS

Chicago Bridge & Iron Works Moves Cleveland Office

The Cleveland office of the Chicago Bridge & Iron Works, whose main office is at 37 West Van Buren Street, Chicago, Ill., was moved on September 15 to the Midland Bank Building, Cleveland. G. S. Sangdahl, District Sales Manager, has been in charge of this office since it was opened several years ago.

Two New Snow Fighters

At midnight on a night last winter after one of the season's heaviest storms, the board of public works in a Middle Western city of 80,000 inhabitants diverted all traffic except street cars from downtown streets. Using a new gas-driven plow, the snow was cleared from the center of each street and placed in windrows. The plow was followed by trucks astride the windrows, and the snow was scooped from the pavement and loaded into the trucks with a gas-driven power scoop that had a bucket with a capacity of 9 cubic feet, or 1,500 pounds. By 4:30 A.M. the principal downtown streets were free from snow, and business the following day was un-

THE NEW CLARKTOR PLOW

hampered by snow; no slushy or snow-blocked streets; no stoppage of busy traffic.

The plow was a new model built by the Clark Tructractor Co., Battle Creek, Mich., which is being offered generally on the market this season. It has an 82-inch blade which cleans a path 74 inches wide. The blade is adjustable, always under the operator's control and has a cutting edge of special hardened alloy steel to take the wear. The plow assembly is supported by heavy springs mounted to absorb road shocks, and in lowered position the blade rides on two steel buttons which prevent the edge of the blade from striking slight irregularities in the pavement.

The plow is built on the sturdy Clarktor chassis. The Clarktor is an industrial tractor driven by gas power, therefore competent for 24 hours' continuous operation. In summer the plow assembly may be easily removed and a 72-inch rotary broom substituted. At any time the Clarktor may be used as a general purpose tractor.

The equipment used in loading snow into trucks was the new Clarktor power shovel. This is permanently built on the

LOADING SNOW WITH A CLARKTOR SHOVEL

Clarktor chassis. Improved hydraulic cylinders enable the operator to pick up and hold the load at any desired point. The bucket clearance raised is 7 feet 5 inches and dumped, 6 feet 5 inches. Municipalities, park boards, contractors, industrial corporations, and railways will find this power scoop of value on many kinds of work besides snow removal. It will handle fast and economically any loose, semi-liquid material such as sand, gravel, bulk cement, soft coal, ashes, fertilizer. The rig is said to do the work of from ten to fifteen barrow and shovel men.

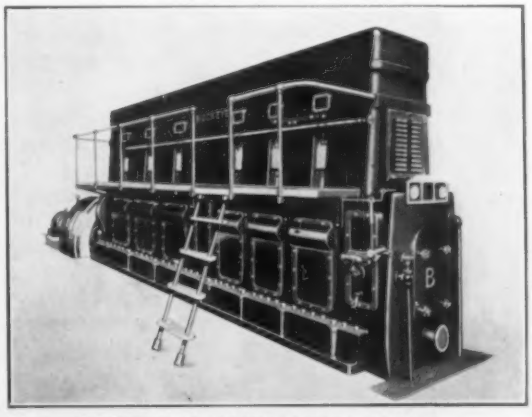
Diesel Power for Municipal Plants

The theory of perfect combustion has been well known for years, but that it has remained a problem for more practical solution, especially on the airless injection type engine, is evidenced by the varied designs of cylinder heads and supplementary devices employed on two- and four-cycle engines to aid combustion.

Realizing that a plain cylindrical combustion chamber, without restriction or impediments, would produce the best results, the Buckeye Machine Co., Lima, Ohio, has developed a method of obtaining a thorough admixture of fuel and air in the combustion space by admitting air in a unique and simple manner in order to confine the entire force of impulse against the piston head.

The air entering the cylinder creates a turbulence or whirl that continues through the entire cycle of suction and compression. When the injected fuel comes in contact with this rapidly moving air, it is so thoroughly mixed that conditions for perfect combustion are created, assuring greater fuel economy.

Buckeye diesel engines are made in sizes from 50 to 600 horsepower, providing power to suit all sizes of municipal light, power and water-works plants. These engines have full pressure lubrication throughout with inbuilt air, fuel-oil and lubricating-oil filters and cylinder heads which may be removed without disturbing the manifolds or piping. All parts of the engines are fully enclosed, insuring the safety of the operator and yet in no way interfering with accessibility for engine adjustments.



A TYPICAL BUCKEYE DIESEL ENGINE INSTALLATION

A New Gang Mower Attachment

A new gang mower attachment has been designed by the Jacobsen Manufacturing Co., Racine, Wis. It is designed to hook onto the front of the regular Jacobsen 4-acre heavy-duty mower with rubber-tired wheels, giving the mower two extra cutting units, or three in all, with a cutting capacity of 10 acres a day. This special gang mower attachment cuts a 58-inch swath. The

THE NEW GANG MOWER FOR ATTACHMENT TO JACOBSEN 4-ACRE MOWER

complete mower is easy to handle. It can be turned in a 3-foot circle.

Nolte Elected President of Robert W. Hunt Co.

The Robert W. Hunt Co., engineers, 2200 Insurance Exchange, Chicago, Ill., has announced that John J. Cone, President and a member of that company since its organization in 1888, has retired. C. B. Nolte, Vice-President and General Manager, has been elected President and General Manager of the company, with headquarters at the general office in Chicago. J. C. Ogden, a Director and Eastern Manager of the company, has been elected Vice-President, with headquarters at New York City.

Low cost real estate development made possible with . . . .

Corrugated Culverts

GOHI Culverts are easy to handle and quick to install. No doubt about it. The three men shown placed 300 feet of 72-inch diameter culvert in 10 hours' time — 30 feet an hour.

The installation was a large real estate development. Time was a vital factor. Less than two hours after the culvert men got on the job, it was possible to begin back filling.

No lost motion. No idle equipment. No days of delay and waiting between the start and finish of the culvert installation.

Rapid, low cost installation . . . strength to withstand the weight of the heaviest tractor . . . flexibility to prevent breakage under the pressure of freezing water and settling earth fills . . . these are some of the advantages of GOHI Culverts — reasons why you should use GOHI for all highway drainage, and other culvert installations.

Made of Genuine Open Hearth Iron — pure iron-copper alloy — GOHI Culverts offer maximum resistance to corrosion . . . no one yet knows for how many years.

Get all the facts. You'll specify and insist on GOHI Corrugated Culverts for every drainage job.

GENUINE OPEN HEARTH IRON — GOHI — PURE IRON - COPPER ALLOY — TRADE MARK — REG. U.S. PAT. OFF.

(Meet copper-bearing pure iron requirements in all accepted specifications for corrugated metal culverts.)

Use GOHI Culverts for

Highway Drainage
Airports
Storm Sewers
Railway Roadbed Drainage
Real Estate Developments
Golf Courses
Drainage of reclamation areas
Temporary or permanent Flumes.
Reservoir Syphons and Outlets

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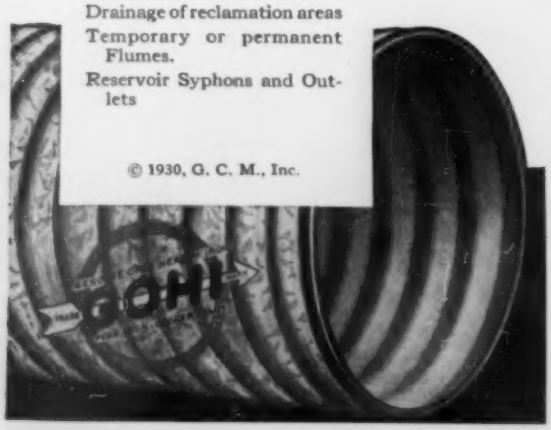

GOHI CULVERT MANUFACTURERS, Inc.
Newport, Ky.

Lincoln Steel and Forge Co. St. Louis, Mo.	**Tennison Brothers** Texarkana, Ark.
The Newport Culvert Co. Newport, Ky.	**Capital City Culvert Co.** Madison, Wis.
The Pennsylvania Culvert Co. Philadelphia, Pa.	**Central Culvert Co.** Ottumwa, Iowa
Denver Steel & Iron Works Co. Denver, Colo.	**Roanoke Sales Corp.** Roanoke, Va.
A. N. Eaton, Metal Products Omaha, Nebr.	**St. Paul Corrugating Co.** St. Paul, Minn.
Feenaughty Machinery Co. Portland, Oregon	**Tennison Brothers** Oklahoma City, Okla.